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STATE OF OREGON

REPORT
STATE HIGHWAY COMMISSION

1927 - 1928

Eighth Biennial Report

OF THE

Oregon State Highway Commission

Covering the period December 1, 1926,
to November 30, 1928

OREGON STATE HIGHWAY COMMISSION

H. B. VAN DUZER, Chairman
C. E. GATES, Commissioner; ROBERT W. SAWYER, Commissioner
ROY A. KLEIN, State Highway Engineer

SALEM, OREGON
STATE PRINTING DEPARTMENT
1929

OREGON STATE HIGHWAY COMMISSION

FORMER MEMBERS AND TERMS

E. J. ADAMS, Eugene, Feb. 28, 1917, to March 31, 1918.

W. L. THOMPSON, Pendleton, Feb. 28, 1917, to Oct. 15, 1919.

S. BENSON, Portland, Feb. 28, 1917, to Nov. 15, 1920.

J. N. BURGESS, Pendleton, Oct. 16, 1919, to Nov. 21, 1919.

E. E. KIDDLE, Island City, Nov. 26, 1919, to Dec. 28, 1920.

R. A. BOOTH, Eugene, April 1, 1918, to May 28, 1923.

J. B. YEON, Portland, Nov. 22, 1920, to March 31, 1923.

W. B. BARRATT, Heppner, Jan. 8, 1921, to March 28, 1923.

WM. DUBY, Baker, March 27, 1923, to July 31, 1927.

W. H. MALONE, Corvallis, May 28, 1923, to March 31, 1927.

PRESENT MEMBERS

H. B. VAN DUZER, Portland, appointed April 1, 1923,
reappointed April 1, 1926.

C. E. GATES, Medford, appointed April 1, 1927.

ROBERT W. SAWYER, Bend, appointed Aug. 1, 1927,
reappointed April 1, 1928.

TABLE OF CONTENTS

PAGE

PART ONE. REPORT OF HIGHWAY COMMISSIONERS

General Resume of the Work of the Biennium 9
Statement of Receipts and Disbursements Through State Highway Fund 36
Statement of Receipts and Disbursements Through Market Road Fund 38
Statement of Receipts and Disbursements by Months, State Highway Fund and Market Road Fund 39
Receipts and Apportionments of Motor Vehicle License Fees 40
Comparison of Yearly Revenues with Yearly Requirements for Interest and Maturities on Bonds, Maintenance and Other Fixed Expense 41
List of Jobs Advertised and Contracts Awarded 42

PART TWO. REPORT OF HIGHWAY ENGINEER

Progress in State Highway Construction 49
Work Under Contract 50
Revenues and Expenditures 51
Funds Available for Expenditure During 1929 and 1930 52
Federal Aid 53
Map of Federal Aid Highway System 55
Forest Highways 57
Federal Aid Funds and Federal Forest Road Funds Apportioned to Oregon 58
County Cooperation in Work on State Highways 59
Market Roads 59
Roosevelt Coast Highway 66
Paving 67
Broken Stone and Crushed Gravel Surfacing 68
Grading 69
Bridges 70
Betterment Work 74
Maintenance Work 78
Patrol Maintenance 80
Oiling of Crushed Rock and Gravel Surfacing 81
Bituminous Paving Repair Work 86
Snow Removal 88
The Use of Drainage Tunnels in Highway Maintenance 90
State Parks 91
Organization 93
Equipment Department 98
Legal Department 101
State Traffic Division 104

PART THREE. FINANCIAL STATEMENTS, 1927-1928

Table I. Statement of Receipts and Disbursements Through State Highway Fund 108
Table II. Summary of Net Incomes and Net Expenditures 110
Table III. Detailed Summary of Net Income 111
Table IV. Detailed Summary of Net Expenditures 112
Table V. Construction Expenditures Summarized by Counties 113
Table VI. Maintenance Expenditures Summarized by Counties 114
Table VII. Construction Expenditures Summarized by Highways 115
Table VIII. Maintenance Expenditures Summarized by Highways 116
Table IX. Detailed Statement of Expenditures for New Construction 116-A
Table X. Detailed Statement of Expenditures for Major Betterments 116-E
Table XI. Detailed Statement of Expenditures for Special Maintenance 116-G
Table XII. Detailed Statement of Expenditures in Connection with Federal Forest Road Work 116-I
Table XIII. Minor Betterment Expenditures Summarized by Counties 117
Table XIV. General Maintenance Expenditures Summarized by Counties 118
Table XV. Betterment Expenditures Classified as to Kind of Work 119
Table XVI. Maintenance Expenditures Classified as to Kind of Work 120
Table XVII. Expenditures for Operation of Draw Bridges and Ferries 121
Table XVIII. Expenditures in Connection with Equipment and Supplies 121
Table XIX. Expenditures for Parks and Timber Preservations 122

TABLE OF CONTENTS—Continued

		PAGE
Table XX.	Expenditures for Extra Right-of-Way, Quarries and Maintenance Patrol Stations	123
Table XXI.	Expenditures for Surveys	124
Table XXII.	Expenditures for Construction Engineering on County Work	126
Table XXIII.	Expenditures for General and Miscellaneous Purposes	127
Table XXIV.	Market Road Receipts and Disbursements Summarized by Counties	128

PART FOUR. STATISTICAL INFORMATION

Table No. 1.	Mileages of State Highways Improved and Maintained, 1913 to 1928	130
Table No. 2.	Expenditures in Connection with State Highway Improvement and Maintenance, 1917 to 1928	131
Table No. 3.	State Funds Received and Expended, 1917 to 1928	131
Table No. 4.	Incomes from Different Sources, 1917 to 1928	132
Table No. 5.	Expenditures for Different Purposes, 1917 to 1928	134
Table No. 6.	Construction Expenditures Classified by Counties, 1917 to 1928	136
Table No. 7.	Construction Expenditures Classified by Highways, 1917 to 1928	137
Table No. 8.	Maintenance Expenditures Classified by Counties, 1917 to 1928	138
Table No. 9.	Maintenance Expenditures Classified by Highways, 1917 to 1928	139
Table No. 10.	Forest Road Expenditures Classified by Counties, 1917 to 1928	140
Table No. 11.	Forest Road Expenditures Classified by Highways, 1917 to 1928	141
Table No. 12.	Statistics Pertaining to Forest Road Work, 1917 to 1928	142
Table No. 13.	Forest Highway Work Performed, 1927-1928	143
Table No. 14.	County Bond Issues for Road Purposes, 1913 to 1928	144
Table No. 15.	County Disbursements for Road Purposes, 1921 to 1928	146
Table No. 16.	Motor Vehicle Registrations and Revenues, 1913 to 1928	147
Table No. 17.	Mileages of State Highways Classified by Counties	148
Table No. 18.	Mileages of County Roads	149
Table No. 19.	Mileages of Highway Improvement Classified by Highways	150
Table No. 20.	State Highway Equipment Account	151
Table No. 21.	Condensed Inventory of Equipment, Shops and Warehouses	151
Table No. 22.	Inventory of Heavy State-owned Equipment	152
Table No. 23.	Mileages of Work Performed, 1927-28, Classified by Sections	154
Table No. 24.	Mileages of Surveys, 1927-28	160
Table No. 25.	Bridge Design and Bridge Construction, 1927-28	162
Table No. 26.	Bridge Designs Prepared for Counties, 1927-1928	165
Table No. 27.	Market Road Apportionments, 1920 to 1928	167
Table No. 28.	Market Road Apportionment, 1927	168
Table No. 29.	Market Road Apportionment, 1928	169
Table No. 30.	Market Road Receipts and Expenditures, 1927	170
Table No. 31.	Market Road Receipts and Expenditures, 1928	171
Table No. 32.	Market Road Receipts and Classification of Expenditures, 1927-28	172
Table No. 33.	Market Road Receipts and Classification of Expenditures, 1920 to 1928	173
Table No. 34.	Apportionment of Multnomah County's Surplus Market Road Funds, 1920 to 1928	174
Table No. 35.	Market Road Advances to Counties, 1920 to 1928	175
Table No. 36.	Expenditures by Counties Under Market Road Act, 1920 to 1928	176
Table No. 37.	Maintenance Expenditures on Market Roads, 1925 to 1928	177
Table No. 38.	Mileages of Construction Under Market Road Act, 1920 to 1928	178
Table No. 39.	Mileages in County Market Road Systems	179
Table No. 40.	Park Sites Acquired by Highway Commission	180
Table No. 41.	Rights-of-way Acquired by Highway Commission	186
Table No. 42.	Stock Pile and Storage Sites Acquired	191
Table No. 43.	Rock Quarries and Gravel Pits Acquired	198
Table No. 44.	Patrol Station Sites, Shop Sites, Etc., Acquired	208
Table No. 45.	Volume of Travel to Crater Lake and to the Oregon Caves	211
Table No. 46.	Results of State Highway Traffic Counts, 1927 and 1928	212
Table No. 47.	Comparison of State Highway Traffic Counts, 1923 to 1928	220

PART FIVE. DESCRIPTIONS OF INDIVIDUAL PROJECTS

PART SIX. MARKET ROAD WORK

LETTER OF TRANSMITTAL

SALEM, OREGON, December 1, 1928.

HONORABLE I. L. PATTERSON,
Governor of the State of Oregon.

Dear Sir. In compliance with section 4432, title XXX, Oregon Laws, we have the honor to submit herewith the report of the Oregon State Highway Commission for the period December 1, 1926, to November 30, 1928.

Respectfully submitted,
OREGON STATE HIGHWAY COMMISSION
H. B. VAN DUZER, Chairman,
C. E. GATES, Commissioner,
ROBERT W. SAWYER, Commissioner.

Eighth Biennial Report

OF THE

State Highway Commission

OF THE

State of Oregon

1927-1928

PART ONE

It is the purpose of this report to review briefly the work accomplished during the biennial period and include therewith such summaries of previously completed work as are necessary to bring previous reports up to date.

The completed program for the biennium totals 0.8 miles of pavement, 107.6 miles of bituminous macadam, 619.6 miles of oiled macadam, 209.8 miles of crushed rock or gravel surfacing, 154.7 miles of crushed rock or gravel resurfacing, 147.7 miles of grading, and 32.9 miles of grade widening. The forest road construction as reported by the United States Bureau of Public Roads is 71.1 miles of crushed rock or gravel surfacing, 41.9 miles of grading and 21.7 miles of grade widening, and the improvement within Crater Lake National Park on state highway routes totals 12.0 miles of oiled macadam. The counties, as cooperative aid on the state highway system, have surfaced 5.6 miles and graded 23.4 miles with their own forces.

The total amount expended through the state highway fund in the biennium, including cooperative county payments, but excluding market roads, is $20,531,687.18, of which state funds total $17,449,814.70; county, $1,302,305.17; miscellaneous sources, $85,605.47; and federal aid, $1,693,-961.84. Of the state funds, the sum of $6,599,276.86 has been used for the payment of principal and interest on the bonded indebtedness. Included in the above state funds, there is $250,943.85 of state funds expended for forest highways, to which was added $160,155.15 of county cooperative funds and $582,789.12 of government forest highway funds, making a total forest highway expenditure on state highways of $993,-888.12. Forest highway funds are expended under the supervision of the United States Bureau of Public Roads, and the federal and county funds do not pass through the state highway fund.

The close of the year 1928 rounds out the twelfth year since the adoption of the state highway plan and program of 1917. In that period highway improvements have followed each other in rapid succession in

all parts of the state until at the present time on the state highway system of 4,368.3 miles, 3,723.7 miles have been improved and only 644.6 miles remain unimproved. The work done by the Commission to date consists of 729.3 miles of paving, of which 178.3 miles are of the cement concrete type and 551.0 miles are of the bituminous type; 107.6 miles of bituminous macadam; 1,194.4 miles of oiled macadam; 2,347.1 miles of rock or gravel surfacing; 39.1 miles of repaving; 453 miles of resurfacing and 141.6 miles of regrading. These figures do not include the forest roads on the state system, which are constructed under the supervision of the United States Bureau of Public Roads, which reports a total of 442.3 miles of crushed rock or gravel surfacing and 503.0 miles of grading. Also, there has been constructed on the state highway system within the Crater Lake National Park 3.0 miles of bituminous macadam and 12 miles of oiled macadam, this work having been financed by a special appropriation of the Federal Government. In addition, there are some counties which have graded or improved sections of state highway with their own forces or by contract, of which this department does not have a record. To be added to the total, also, are the state highways within Multnomah County and through incorporated cities of more than 2,000 population, which have done their own work without assistance from the state. Considering the added mileages, but noting the fact that graded roads have been rock surfaced, and rock surfaced roads have been paved and oiled, the present status of the state highway system is: 895.4 miles of pavement, 20.5 per cent; 112.0 miles of bituminous macadam, 2.6 per cent; 1,098.8 miles of oiled macadam, 25.1 per cent; 1,383.7 miles of crushed rock or gravel surfacing, 31.7 per cent; 233.8 miles graded and ready for surfacing, 5.3 per cent; and 644.6 miles unimproved, 14.8 per cent. There have been 508 bridges of standard design over 20 feet in length constructed by the department on state highways during the twelve-year period of its activities.

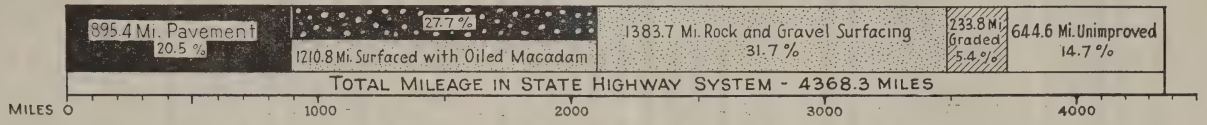
The gross expenditures of the Commission, not including market roads, over the twelve-year period have been $119,533,609.23, of which $13,878,181.63 is county funds, $11,670,376.39 government funds, $548,280.41 funds from miscellaneous sources, and $93,436,770.80 state funds. Of state funds, the sum of $22,570,095.54 has been used in the payment of principal and interest on bonded indebtedness.

The Commission has continued the well-established policies of its predecessors, and the construction program of the biennium has consisted in a large measure of completing unfinished contracts carried over from the previous year, placing under contract units in uncompleted gaps of main through highways and extending branch highways and connections as fast as funds were available, so that the public might secure the maximum benefit from the improvement. The policy of surfacing graded roads as soon as the roadbed has become thoroughly settled has been followed consistently.

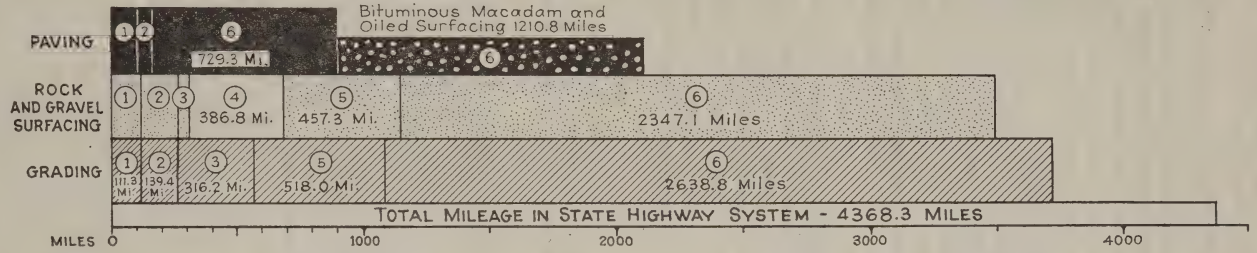
It has been the general plan of the Commission to award contracts in the late summer and fall for work to be done during the following summer construction season, relying on the next year's funds to pay for these projects. However, because of the uncertainty as to the amount of funds to be available in 1929 due to the initiative measure on the ballot at the November, 1928, election seeking to reduce motor vehicle license fees, very few contracts were awarded in the latter part of 1928. This uncer-

CHART SHOWING PROGRESS IN STATE HIGHWAY IMPROVEMENT

I. State of Improvement Nov. 30, 1928



II. Mileages of various classes of work performed in bringing the State Highway System to its present state of improvement.



1. Work done by Multnomah County and City of Portland (109.6 miles pavement, 111.3 miles rock surfacing and 111.3 miles grading.
2. Work done by incorporated cities outside of Multnomah County (56.5 miles pavement, 139.4 miles rock surfacing and 139.4 miles grading.)
3. Work done by counties other than Multnomah County (48.0 miles rock surfacing and 316.2 miles grading.)
4. This space represents sections of highway which were not surfaced with rock or gravel prior to paving
5. Work done by Federal Government in National Forests and National Parks. (Park work consists of 3.0 miles bituminous macadam, 12.0 miles oiling, 15.0 miles rock surfacing and 15.0 miles grading.)
6. Work done under direct supervision of State Highway Commission.

tainty having been removed by a strong negative vote on the initiative measure, the award of contracts will be resumed in December and continue through the winter months.

The outstanding features of the work of the biennium are as follows:

The Pacific and West Side Pacific Highways have been considered as completed, but betterments have been necessary. Of bridge replacements, mention is made of the Rogue River bridge at Gold Hill, Foots Creek bridge near Gold Hill, and the Luckiamute River bridge near Monmouth. To straighten and widen the Pacific Highway between Canemah and New Era, a contract covering 4.67 miles was awarded in the spring of 1928. This grading will probably be completed in January of 1929. It is expected to pave this unit with pavement 20 feet wide in 1929. This improvement includes a reinforced concrete bridge across Parrott Creek at New Era Station. Through a cooperative agreement with the Southern Pacific Railroad Company, the revised alignment has been laid so as to permit future straightening of the Southern Pacific tracks and the addition of a second main line. The railroad company is paying for all additional work of this nature.

Of importance to the state highway program is the widening and straightening by Multnomah County of state highway routes leading out of Portland. On the lower Columbia River Highway toward Linnton, 4.4 miles of 18-foot pavement has been increased to 38 feet width and 1.9 miles to 27 feet width at a cost of $400,497. On the upper Columbia River Highway on the Sandy Road, 1.5 miles of pavement has been widened from 18 feet to 36 feet and 5.8 miles to 27 feet at a cost of $216,197. On the Pacific Highway south, there was an extensive grading program 1.5 miles in length which eliminated bad alignment and grades, 1.1 miles of new pavement 27 feet wide was laid and 0.4 mile was increased in width to 36 feet, while 1.2 miles were increased to 28.75 feet in width at a total cost of $203,569, which included a concrete bridge at Riverdale costing $27,470.

On the West Side Pacific Highway, 0.6 miles of pavement has been widened from 18 feet to 36 feet at a cost of $96,037, including an overhead crossing of the Oregon Electric at Multnomah Station which cost $44,737. The Mt. Hood Highway from Gresham to the Clackamas County line was paved 20 feet wide at a cost of $90,764. The Canyon Road connecting with the Tualatin Valley Highway, involving extensive alignment and grade revision and widening 3.0 miles in length extending to the Washington County Line, was completed in 1928 with an oiled macadam surface. The total cost was $809,072. This project will be the main traffic artery out of Portland to the west. It is expected that it will be paved in 1930. All of the above projects were paid for from Multnomah County bond funds voted at an election in 1926. No state funds have been expended in Multnomah County.

Considerable progress worthy of mention has been made on the Roosevelt Coast Highway. The completion of the grading and surfacing of the Garibaldi-Mohler Unit has opened up the beach resorts on this section of the Tillamook coast for all-year travel. The surfacing of the Siletz River-Otter Rock Section and the completion of the bridges at DePoe Bay and Rocky Creek have opened up the Hebo-Newport Unit so that the Roosevelt Coast Highway is now complete on state standard grade and alignment between Astoria and Newport, a distance of 155 miles. South from

Yaquina Bay a contract for grading to Seal Rocks is now under way. There is also a graded unit 6 miles in length north of Florence and a 4-mile unit north of Gardiner, the last 2 miles of which were graded in 1928. This leaves 55 miles remaining to be built, but excluding waterways, to complete the Roosevelt Coast Highway. There are six major waterways crossed by the Roosevelt Coast Highway. Beginning at the north these are Yaquina Bay, Alsea Bay, Siuslaw River, Umpqua River, Coos Bay and Rogue River. Bridges at these points will be expensive structures.

During the present year, surfacing has been completed between Reedsport and Lakeside, giving an all-year road between Coos Bay and the Umpqua River, while in the previous year surfacing was completed on the remaining units in Curry County so that the Roosevelt Coast Highway is now an unbroken standard state highway between the California state line and Reedsport, a distance of 172 miles.

In October, 1927, the Commission placed in operation a ferry across the Rogue River operating between Indian Creek, east of Gold Beach, and Wedderburn, on the Roosevelt Coast Highway. In May, 1928, the Commission took over the ferry formerly operated across Coos Bay between North Bend and Glasgow by Coos County. Both of these are free ferries and are in service from 7:00 a. m. to 11:00 p. m. Their schedule is two round trips an hour. The average monthly operating costs without adding depreciation are: Rogue River, $1,000; Coos Bay, $2,200.

The grading, surfacing and bridge projects placed under contract during the biennium have completed the Redwood Highway throughout its entire length in Oregon.

The completion of the surfacing on the Oregon-Washington Highway between Jones Hill and Vinson has opened up the last unit of this highway and made possible all-year direct travel between Heppner and Pendleton.

The surfacing of the forest project across Quartz Mountain, the surfacing of the Lakeview-Drews Valley Unit, the grading of the Devil's Garden Section and the surfacing from Beatty to the Forest Boundary, the first three of which are completed and the last under contract, will complete the Klamath Falls-Lakeview Highway except for the 8-mile unit between Dairy and Bly Mountain. This latter project would have been completed before now except for litigation instituted by local residents to force construction on a roundabout location through Bonanza. This delayed construction, but this project has been placed on the 1929 program.

Appreciable progress has been made on the Fremont Highway by extending the improved road from Paisley north to Ana Spring, which makes a completed unit of 77.5 miles north of Lakeview.

A start has been made toward completing the gap of 32.4 miles in the Ochoco Highway connection with the John Day Highway. During 1928, 7.5 miles east from Mitchell to the Keyes Creek Summit was graded, leaving 24.9 miles unimproved.

The surfacing of the Unity-Hereford Section of the Baker-Unity Highway has made that route an all-year route which is taking a considerable amount of travel.

To connect with the Canyon Road improvement in Multnomah County, the 3.0-mile unit of the Tualatin Valley Highway between the Multnomah County line and Beaverton was regraded in 1928 with the expectation of

paving it in 1929. This unit was graded 40 feet wide and is of high standard alignment and grade and offers a substantial improvement over the present route.

Cooperation by Benton County has made possible the completion of the remaining units of the Alsea Highway and the Corvallis-Newport Highway. The Santiam Highway project has been advanced by the grading of the Lebanon-Shea's Hill Section and further work in the National Forest.

On the Old Oregon Trail across the summit of the Blue Mountains, freezing and thawing conditions at each spring breakup have made necessary an extensive drainage program and resurfacing, placing a large amount of coarse rock as a sub-base.

The surfacing of the Unity-Brogan Section of the John Day Highway has completed this highway throughout its length and as it becomes better known as an alternate route between Arlington and Ontario it should receive a large increase in travel.

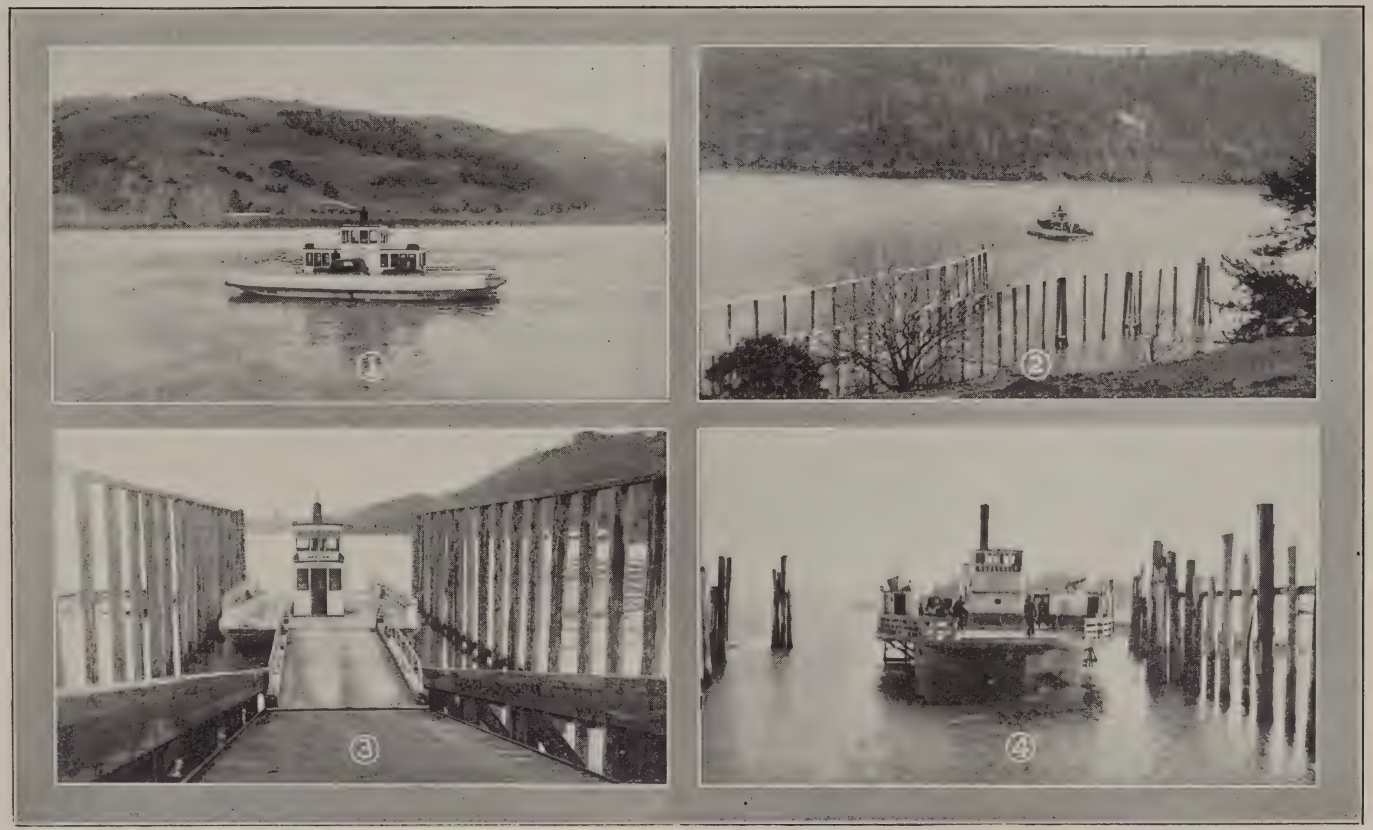
Pacific Highway travel has been greatly facilitated by the removal of street-car tracks in Salem and Eugene. Credit should be given to the city of Roseburg for the construction of a reinforced concrete bridge over Deer Creek and to the city of Salem for a similar structure over Mill Creek. Both of these structures are on the Pacific Highway and are built the full width of the street, replacing inadequate old steel and timber structures. An improvement of note at the north city limits of Corvallis has been the paving of two blocks on the Albany-Corvallis Highway. Municipal paving in Astoria replacing plank streets has made the lower Columbia River Highway paved throughout the city, 6.2 miles. Hood River has likewise completed paving at the west city limits, and in the city of Bend. The Dalles-California Highway is paved throughout.

Among the important bridges which have been completed within the two-year period are the two concrete arch bridges at DePoe Bay and Rocky Creek on the Roosevelt Coast Highway in Lincoln County, the Pacific Highway bridge across Rogue River at Gold Hill, the Luckiamute River bridge on the West Side Pacific Highway in Polk County and the Willamette River bridge at Springfield.

The personnel of the Commission has changed during the biennium. C. E. Gates was appointed to succeed W. H. Malone at the expiration of his term on April 1, 1927. Robert W. Sawyer succeeded William Duby who resigned on August 1, 1927. Mr. Sawyer was reappointed April 1, 1928. H. B. Van Duzer was elected Chairman August 20, 1927. Roy A. Klein has continued to serve as State Highway Engineer and Secretary to the Commission.

During the biennium, 34 meetings occupying 39 days have been held. Three of these have been held with the Washington Highway Committee and one with the Board of County Commissioners of Multnomah County relative to the Interstate Bridge at Vancouver. The regular meetings are held once each month in the Courthouse in Portland, the county officers granting free use of the commissioners' room, for which the Commission is indebted. Many delegations from distant parts of the state have attended these meetings as well as large numbers of bidders, so that these accommodations are very desirable and convenient.

A total of 113 state projects and 16 county projects have been advertised. County projects have been advertised at the request of the county courts, since they feel that in this way they can secure greater competition, and the Commission is glad to accommodate them in this respect.



VIEWS OF FREE FERRIES OWNED AND OPERATED BY THE STATE ON THE ROOSEVELT COAST HIGHWAY. VIEWS 1, 2 AND 3 ARE OF THE ROGUE RIVER FERRY. VIEW 4 IS OF THE COOS BAY FERRY

Of the 113 state projects, no bids were received on four, and on six the bids were rejected because they were in excess of the engineers' estimates and readvertised with the result that lower figures were submitted at the following letting. The total number of bids received on state projects was 677 or an average of six bids on each project; the largest number of bids on any one project was 19.

The total number of state contracts awarded during the two-year period was 103, which vary greatly, of course, in size and value. A complete statement of dates of award, description of projects, names of successful bidders, numbers of bids, etc., will be found in an accompanying table.

Strong competition among the bidders continued and in most cases there was only small difference between the low bid and the next higher. While bids have been generally low and below the Engineer's estimate, there have been but few jobs on which it has been necessary to call in the sureties to finish the work. Also, while no cases of large losses have been authenticated, there are no reports of large profits. It may be fair to assume that the majority of the contractors are making a fair profit, which is as it should be. As may be expected, many of the same contractors are bidding year after year, with some new entries and some withdrawals.

A study of comparative bid prices on the contracts awarded over the past few years will indicate a downward trend, particularly in prices for crushed rock or gravel surfacing. This may be accounted for by the fact that better crushers have been placed on the market; that cheaper power is obtained from Diesel engines; that contractors are setting up plants of greater capacity; and that mechanical loading is being used more extensively. It has been necessary in many cases to install a water supply and wash materials to secure clean rock or gravel for oiling and bituminous macadam work.

In grading work, the increased use of small gas shovels, tractors with fresnoes, small trucks, etc., has had the effect of reducing costs over team and manual methods. In bridge construction many economies have been effected by the standardization of many details.

It has been the policy of the Commission to place under contract all work which could be handled in that manner, and this policy has been consistently followed in all new construction such as grading, surfacing, paving and bridges, also in furnishing maintenance materials, such as crushed rock or crushed gravel. On the other hand, work which could not be handled in this manner, such as general patrol, weed cutting, snow removal, scarifying, shaping, blading, road oiling, etc., which classifies as maintenance work, has been handled entirely by state forces.

Federal aid allotments have greatly augmented state funds in carrying out the state highway program. However, these government funds may only be expended upon the Federal Aid System which comprises about 7 per cent of the public road mileage of the state or 3,227 miles, and is limited to the interstate highways and more important through-routes within the state.

Originally, the Federal law required 50 per cent cooperation by the states, but a later change gave an advantage to the states having large

areas of public lands by providing that the cooperation could be reduced in certain proportions. Under this amendment, Oregon is required to cooperate 37.77 per cent. There is a limiting factor, however, as to the maximum Federal Aid expenditure per mile, excluding bridges of over 20-foot span, which applied to Oregon, gives a maximum allotment of $18,669 of Federal funds per mile. In many instances where heavy and expensive grading is included in an improvement together with surfacing or pavement, the per mile limitation of Federal funds makes necessary a much greater proportion of state funds.

FEDERAL FUNDS ALLOTTED TO OREGON FOR COOPERATIVE WORK

	For Federal Aid Projects	For Forest Roads	Totals
Act of July 11, 1916, available July 11, 1916, to June 30, 1926	$ 1,181,416.50	$ 1,312,449.00	$ 2,493,865.50
Act of Feb. 28, 1919, available Feb. 28, 1919, to June 30, 1921	3,150,761.76	596,681.00	3,747,442.76
Act of Nov. 9, 1921, available Nov. 9, 1921, to June 30, 1923	1,182,663.90	1,157,109.00	2,339,772.90
Act of June 9, 1922, available July 1, 1922, to June 30, 1925	2,991,316.84	906,488.00	3,897,804.84
Reapportionment of funds, available July 1, 1925, to June 30, 1926	10,575.00	.....	10,575.00
Distribution of "Special Funds"	.....	561,694.89	561,694.89
Act of Feb. 12, 1925, available July 1, 1925, to June 30, 1929	4,734,522.00	2,365,396.00	7,099,918.00
Total funds authorized	$13,251,256.00	$ 6,899,817.89	$20,151,073.89
Expended and obligated to complete project under agreement	12,115,721.49	6,837,944.75	18,953,666.24
Unobligated balances	$ 1,135,534.51	$ 61,873.14	$ 1,197,407.65

When the Oregon Federal Aid System was approved by the Secretary of Agriculture on January 8, 1923, there was some uncertainty as to the northern terminus or connection of the highway north of Lakeview designated as the Prineville-Lakeview Highway and accordingly this highway was ended at Fort Rock for the time being, and sufficient mileage was held unallotted to make connection at either Lapine or Prineville. With the construction of the Great Northern Railroad south from Bend, it was found more desirable to connect with The Dalles-California Highway and thus afford a railroad connection for the Silver Lake District. A survey was made and adopted running northwesterly from Silver Lake through Summit Stage Station to a connection with The Dalles-California Highway one and a half miles south of Lapine. This was submitted to the Secretary of Agriculture and approved as a part of the Federal Aid system. There being some mileage available for further additions to the Federal Aid system, the Umpqua Highway extending from Reedsport on the Roosevelt Coast Highway to Drain on the Pacific Highway was submitted to the Secretary of Agriculture at the request of the Umpqua Highway Improvement District and the County Court of Douglas County, who stated that they would provide the necessary cooperation to meet Federal Aid funds for construction. In due time this project was approved as a part of the Federal Aid System. It is not on the state highway system.

In 1928 Congress passed the Oddie-Colton Bill, S. 1341, which permitted certain of the western states, including Oregon, to increase the mileage of their Federal Aid systems to the extent of the mileage on the present Federal Aid System in National Forest reserves, Indian reservations and other Federal reservations. At a meeting on November 21, 1928, the following highways were submitted to the Secretary of Agriculture for inclusion in the Federal Aid System, totaling 368.4 miles: Central Oregon Highway from a junction with The Dalles-California Highway in the city of Bend to Burns, county seat of Harney County; Corvallis-Newport Highway, from a junction with the Roosevelt Coast Highway at Newport to a junction with the West Side Pacific Highway at Corvallis; Mt. Hood-Wapinitia Highway from the city of Portland to a junction with The Dalles-California Highway near Maupin via Sandy and Government Camp; Salmon River Highway from a junction with the Roosevelt Coast Highway near Otis to a junction with the McMinnville-Tillamook Highway at Valley Junction; Siuslaw Highway from a junction with the Roosevelt Coast Highway near Florence to a junction with the West Side Pacific Highway near Junction City. It is expected that a decision on the application will be received prior to January 1, 1929.

The forest highway projects completed in the biennium have materially advanced the state highway program, at the same time increasing the mileage on the forest highway program. The completion of 12.9 miles of grading and 11.8 miles of surfacing on the Wapinitia Highway leaves only 13.6 miles of surfacing to complete that highway. On the Santiam Highway substantial progress has been made by the addition of 4.0 miles of grading and 6.6 miles of surfacing. The Pendleton-John Day Highway has been improved by 10.1 miles of grading and 18.1 miles of surfacing in Grant County. Some grade widening has been done on the Mt. Hood Loop and the Oregon Caves Road. Eleven miles of surfacing north of Wedderburn and 2.8 miles of grading south of Yaquina Bay represent the work done on the Roosevelt Coast Highway. In Central Oregon, 5.8 miles were graded through the Fremont National Forest on the Fremont Highway while in Southern Oregon the surfacing of the 11.7-mile unit through the National Forest between Klamath Falls and Lakeview completes that section. A beginning has been made on the Willamette Highway in Lane County by the completion of 1.6 miles of grading. In Wallowa County, 9.7 miles of surfacing have been completed on the Flora end of the Flora-Enterprise Highway. In addition, work has been done on other projects not on the state highway system but important to the counties. On the Salmon River Road, 6.0 miles have been graded, while on the Canyon City-Burns Road many miles have been both graded and surfaced to high standards. Of importance to Morrow and Wheeler Counties is the Heppner-Spray Road which has been improved by forest highway construction.

Supplementing the Federal Aid Act, appropriations have been made by the Federal Government for the construction of roads within, partly within, or adjacent to the National Forests. This appropriation is divided into two parts; one for forest highway work which is applicable to state highways or important county and community roads, and the other to roads and trails for forest development. Under the law, the forest highway projects are programmed each year by an agreement between the Bureau of Public Roads, Forest Service and State Highway Commission. The roads and trails portion of the fund is allotted by the Forest Service officers.

Cooperation may be accepted by the Government but is not required on forest highway projects. Forest highway projects are handled by the District Engineer of the Bureau of Public Roads who makes the surveys, takes bids and supervises construction. Present appropriations give Oregon about $600,000 annually for forest highways.

No further bonds have been issued during the biennium. A total of $1,600,000 matured in 1927 and $1,750,000 in 1928. Previous payments of principal amount to $2,633,250, which, together with the payments in the present biennium, total $5,983,250, the amount by which the total indebtedness has been reduced. The total amount of bonds sold was $38,700,000 par value, and by the above payments the bonded indebtedness is now $32,716,750.

STATE HIGHWAY BONDED INDEBTEDNESS ACCOUNT

Year	Annual Principal	Annual Interest	Annual Total	Bonds Outstanding at End of Year
1917	$	$ 5,000.00	$ 5,000.00	$ 1,400,000.00
1918		72,900.00	72,900.00	2,840,000.00
1919		141,099.99	141,099.99	10,140,000.00
1920		503,725.00	503,725.00	19,140,000.00
1921		974,870.83	974,870.83	30,700,000.00
1922	125,000.00	1,521,266.67	1,646,266.67	36,075,000.00
1923	179,750.00	1,742,150.00	1,921,900.00	38,395,250.00
1924	334,500.00	1,824,240.00	2,158,740.00	38,060,750.00
1925	3,797,000.00	1,799,267.05	5,596,267.05	37,263,750.00
1926	1,197,000.00	1,722,761.65	2,919,761.65	36,066,750.00
1927	1,600,000.00	1,663,215.87	3,263,215.87	34,466,750.00
1928	1,750,000.00	1,586,060.99	3,336,060.99	32,716,750.00
1929	1,825,000.00	1,503,578.47	3,328,578.47	30,891,750.00
1930	1,925,000.00	1,418,314.70	3,343,314.70	28,966,750.00
1931	1,975,000.00	1,328,082.18	3,303,082.18	26,991,750.00
1932	1,975,000.00	1,236,724.66	3,211,724.66	25,016,750.00
1933	1,975,000.00	1,145,367.14	3,120,367.14	23,041,750.00
1934	1,875,000.00	1,054,009.62	2,929,009.62	21,166,750.00
1935	1,875,000.00	966,652.10	2,841,652.10	19,291,750.00
1936	1,875,000.00	879,294.58	2,754,294.58	17,416,750.00
1937	1,875,000.00	791,937.06	2,666,937.06	15,541,750.00
1938	1,875,000.00	704,579.54	2,579,579.54	13,666,750.00
1939	1,875,000.00	617,222.02	2,492,222.02	11,791,750.00
1940	1,875,000.00	529,864.50	2,404,864.50	9,916,750.00
1941	1,875,000.00	442,506.98	2,317,506.98	8,041,750.00
1942	1,850,000.00	355,149.46	2,205,149.46	6,191,750.00
1943	1,795,250.00	269,291.94	2,064,541.94	4,396,500.00
1944	1,640,500.00	185,844.42	1,826,344.42	2,756,000.00
1945	1,178,000.00	113,273.15	1,291,273.15	1,578,000.00
1946	778,000.00	61,045.63	839,045.63	800,000.00
1947	375,000.00	29,500.00	404,500.00	425,000.00
1948	225,000.00	15,531.25	240,531.25	200,000.00
1949	150,000.00	6,906.25	156,906.25	50,000.00
1950	50,000.00	1,062.50	51,062.50	
	$41,700,000.00	$27,212,296.20	$68,912,296.20	
Less 1925 Refunding Bonds	3,000,000.00		3,000,000.00	
Totals	$38,700,000.00	$27,212,296.20	$65,912,296.20	

From the accompanying table, it will be noted that the principal payments increase each year to 1931 while interest payments decrease each year. The maximum of interest and principal payments will be reached in 1930, when $3,343,314.70 will be required for principal and interest.

STATUS OF STATE HIGHWAY BONDS

December 1, 1928

Authority	Sold (Par Value)	Matured	Balance Outstanding
State Cooperative Bonds, Chapter 175, Laws 1917	$ 1,200,000.00	$ 700,000.00	$ 500,000.00
State Cooperative Bonds, Chapter 31, Laws 1920	*6,000,000.00	1,575,000.00	4,425,000.00
Six Million Bonds, Chapter 423, Laws 1917	6,000,000.00	1,258,250.00	4,741,750.00
First Ten Million Bonds, Chapter 173, Laws 1919	10,000,000.00	1,950,000.00	8,050,000.00
Second Ten Million Bonds, Chapter, 43, Laws 1920	†12,000,000.00	3,075,000.00	8,925,000.00
Seven Million Bonds, Chapter 383, Laws 1921	6,500,000.00	425,000.00	6,075,000.00
Totals	$41,700,000.00	$ 8,983,250.00	$32,716,750.00
Less refunded issues	3,000,000.00	3,000,000.00	
Total sold	$38,700,000.00		
Total matured and paid		$ 5,983,250.00	
Total balance outstanding			$32,716,750.00

* Includes $1,000,000 of refunding bonds. † Includes $2,000,000 of refunding bonds.

The constitution permits issuance of bonds up to 4 per cent of the assessed valuation of the state, which, based on the equalized valuation of $1,122,332,180.43 for 1928, would equal $44,893,287.22.

In the beginning years of the development of the state highway system, effort was directed to one objective only—the extension of completed mileage. Almost overnight, as it were, the need of a system of modern highways uniting different parts of the state and connecting at our borders with highways in adjoining states had been realized by the people. Every thought and every available dollar went toward actual road construction, the closing of gaps and the elimination of impossible road conditions. With attention concentrated on construction, little regard was given to other matters, such as parks and the preservation of scenic attractions that add to and complement the service of a state highway system. In connection with the construction of the Columbia River Highway in Multnomah County, Mr. Simon Benson, first chairman of the state highway commission, had made a gift of Benson Park on that highway and one or two gifts of small areas on state highways for park purposes had been made by other individuals. The highway commission, however, did not undertake the acquisition of any lands for state park purposes with its own funds. In addition to the concentration on construction this condition was in part brought about by the limited authority granted by the statutes for the acquisition of lands desirable for park purposes or for the preservation of scenic attractions. By an enactment by the 1925 legislature, this authority was extended and since that time many pieces of land, ranging in size from 1½ to 290 acres, have been secured. These include areas suitable for recreation, including picnicking or overnight camping, and areas attractive for the scenic beauty in themselves or in their surroundings. At the same time, generous and public-spirited citizens and friends of Oregon have added to the number of our parks by many welcome gifts. The commission has also been successful in securing from President Coolidge, through the cooperation of Congressman N. J.

Sinnott, a withdrawal from entry of the rocks and pinnacles in the sea on the coast of Oregon, many of which are in view from the Roosevelt Coast Highway. They have thereby been preserved against private use and defacement.

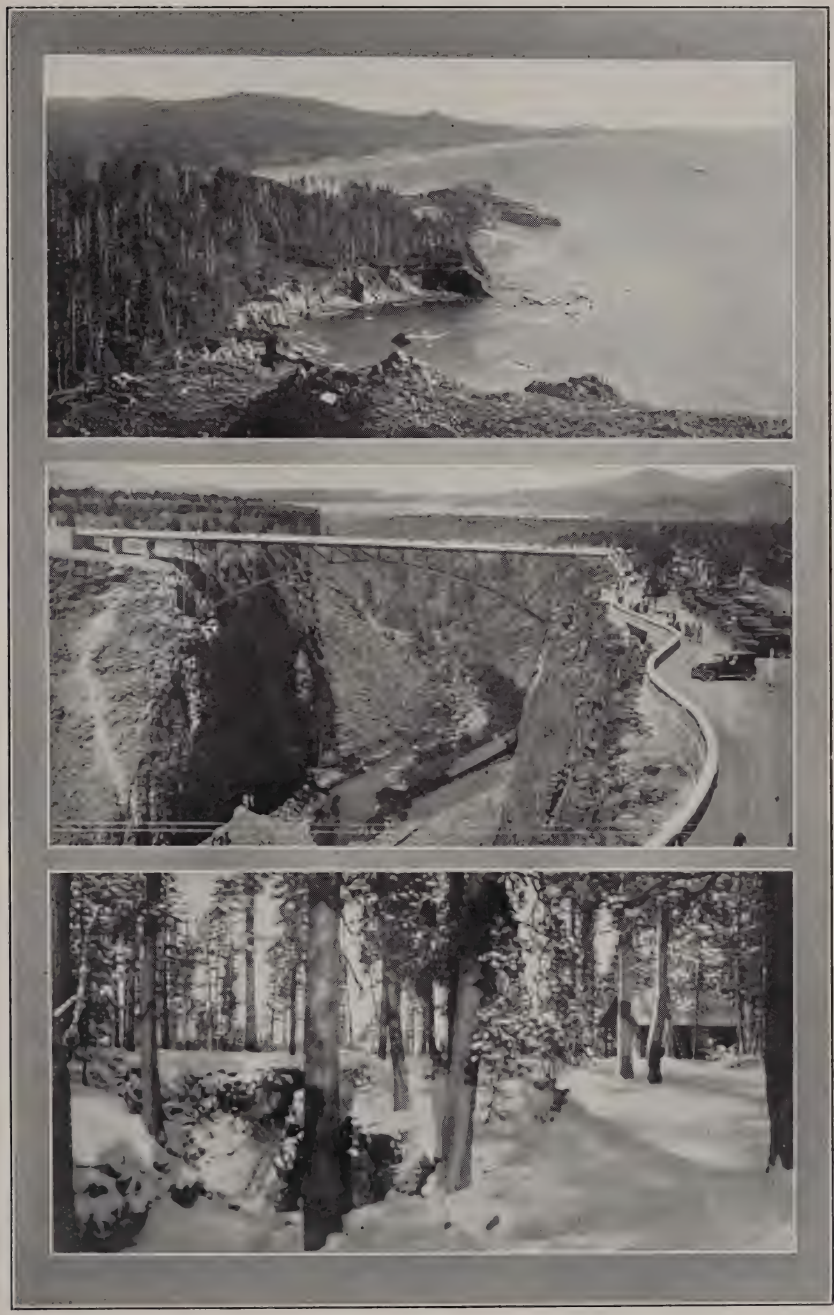
A list of the park sites acquired by the Commission and those given to the state will be found in Part Four of this report. In the past biennium, $109,183.12 has been spent in the acquisition and development of parks. Of this sum the largest single item was $28,933.40 for the building and grounds at Emigrant Springs on the Old Oregon Trail.

One of the scenic preservation activities in which the Commission has taken especial interest has been the acquisition of lands bordering the Old Oregon Trail between Deadman's Pass and La Grande with the stand of trees found thereon. These trees give added beauty to the country through which this highway passes and their removal would leave a desolate and an unsightly waste. In addition, they make the first forest reached by the tourist from the East, and, after his many miles of travel across the open plains and deserts, they are welcomed as gratefully as they were by the emigrants who used the original Oregon Trail. A strip on each side of the road, varying in width from 130 feet to 1,900 feet, has now been acquired for a distance of 30 miles, assuring the permanent preservation of these trees.

In other parts of the state, lumbering had been carried on on lands through which various highways run before any thought had been given to the importance of preserving the trees bordering the right-of-way. In the national forests, the cooperation of the Forest Service is expected to leave along the highways forests in somewhat the same natural condition in which they now exist. In the case of privately-owned lands where logging has not yet been undertaken, a difficult situation is faced. In many cases the timber is in a heavy stand and its stumpage values, often because of the proximity of the highway, are so high as to preclude the possibility of the purchase of the land and standing timber by the Commission. In some cases, owners have practiced selective cutting, taking out the matured or stagnated trees, but leaving a much larger number that in time will give somewhat the appearance of the original stand. Where cutting has not yet begun, the effort is being made to persuade the owners to leave a timbered strip with as little cutting as possible. In addition, it is the desire of the Commission to preserve on the state highway system typical original stands of the various kinds of timber indigenous to Oregon.

In order that it may have the benefit of expert opinion and advice in the selection of park areas, the Commission has appointed as an advisory committee on parks the following: Prof. A. R. Sweetser of the University of Oregon, Prof. A. L. Peck and Prof. G. R. Hyslop of Oregon State Agricultural College, C. J. Buck of the U. S. Forest Service, L. A. McArthur of the Pacific Power & Light Co., and T. R. Conway of the Oregon State Motor Association. This committee has been organized with G. R. Hyslop as secretary, and has held five meetings. Its advice has been of great value to the Commission.

The Commission has also been fortunate in having the interest of Dr. John P. Merriam, president of the Carnegie Institution of Washington, in the development of the state park system. Dr. Merriam, who has long been a student of the geological structures and fossil remains of the



VIEWS IN AND FROM STATE PARKS. TOP—OTTER CREST PARK NEAR NEWPORT; CENTER—PETER SKENE OGDEN PARK NEAR REDMOND; BOTTOM—LAVA CAVE PARK NEAR BEND

John Day Valley, has called particular attention to the importance of that area for state park purposes. Following his recommendation, the Commission has initiated proceedings under the federal recreation act to secure for the state the unentered land in the John Day Valley suggested by Dr. Merriam as desirable for park purposes. When this land has been secured, it is hoped to have Dr. Merriam's advice in its development as a highly valuable educational and scenic attraction on the John Day Highway.

One of the problems faced by those charged with the duty of highway maintenance and those interested in keeping the landscape free from disfigurement and in preserving the scenic beauties of the state, is the regulation and elimination of out-of-door or roadside advertising in non-commercial locations. Within the limits of the highway rights-of-way the Commission has full authority, and it is a satisfaction to note the general understanding to this effect. This has resulted in the almost complete absence of trespass by private individuals for advertising and other purposes. Outside the rights-of-way, the situation is different. Here, with a few notable exceptions, conditions seem steadily to be growing worse. Billboards, painted panels and most other kinds of outdoor advertising are found in increasing number along our most important highways. Frequently words of warning, such as "Stop" and "Slow," which should properly be confined to traffic purposes, are used in an advertising way. It is common to find large billboards or painted panels at curves and near crossroads where, in serving their intended purpose of attracting attention of the motorist, they constitute a hazard. Legislation limiting the use of the words "Stop," "Slow" and other words of caution or direction to legitimate nonadvertising purposes and providing, under the police power, against advertising signs and billboards at curves, crossroads or railroad intersections, is recommended. In other jurisdictions tests of the authority of the state to limit advertising signs on private property along the highways in general are now being made. It is possible that the courts will sustain this activity as a proper use of the police power. It is also possible that the principle of zoning, already sustained by the courts with respect to city areas, may be extended to the country and particularly to lands along the highways and thereby give to the state the means of controlling this most undesirable and unsightly development.

Pending the enactment of regulatory legislation, the Commission urges the development of an enlightened public opinion that without legislation can go far toward controlling this evil. Private individuals and public opinion are now keeping a considerable mileage of our highway system free from all kinds of advertising. It would add tremendously to the beauty of our state and to the fame of our highway system if such advertising were completely eliminated.

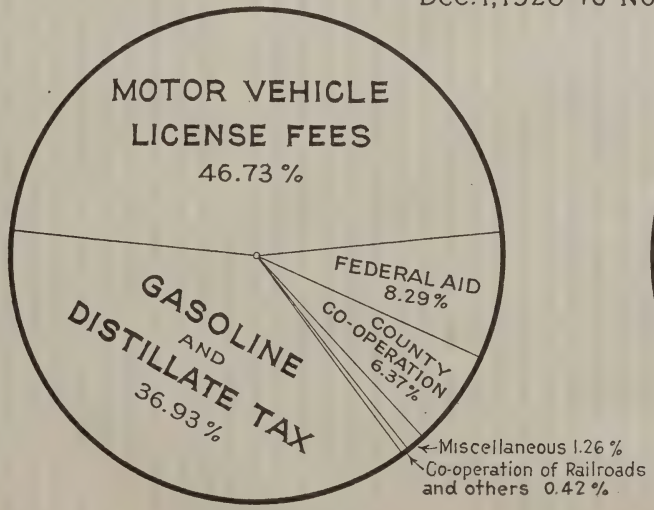
The Commission has adopted the standard warning and caution signs recommended by the United States Joint Board, and some have already been placed. As the signs now in use require replacement, the new designs will be installed. This set of designs is based on definite principles calculated to produce uniformity of significance in the signs themselves, and make familiarity with them easy to acquire on the part of the most casual driver. These principles are a set of shapes, each having its own significance; a set of color combinations, each having its own significance; a few obvious symbols and uniformity of erection.

For instance, a circular sign is used for railroad grade crossings only, and an octagonal sign for stop. Diamond-shaped signs indicate conditions

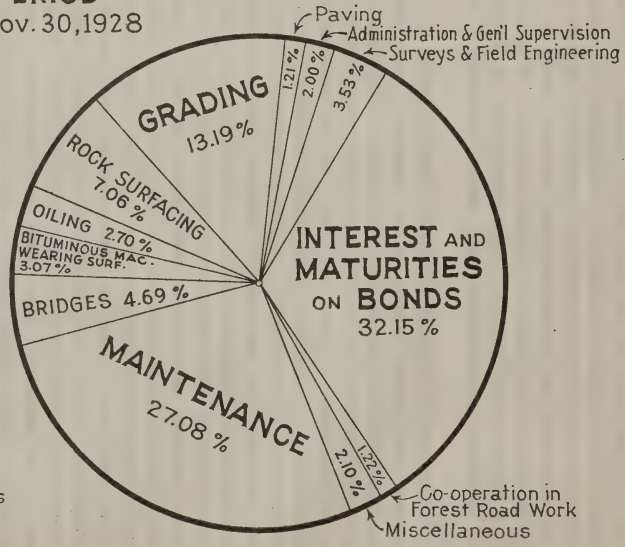
REVENUES AND EXPENDITURES

Graphic presentation of the relative amounts of revenue derived from different sources and the relative amounts expended for different purposes.

TWO YEAR PERIOD
Dec. 1, 1926 to Nov. 30, 1928



REVENUES

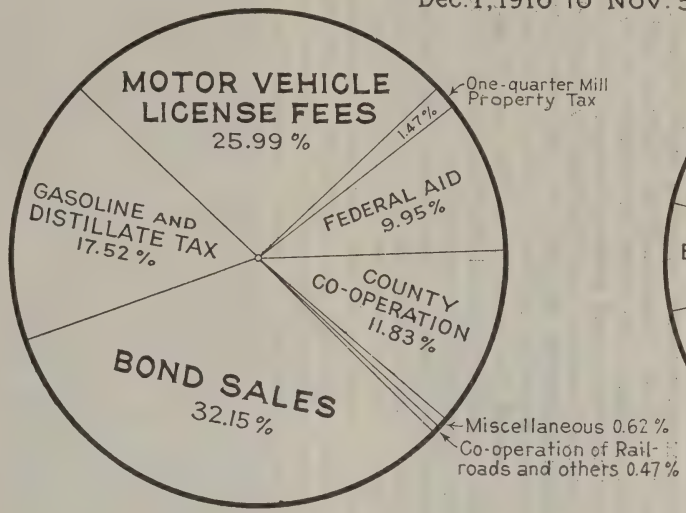


EXPENDITURES

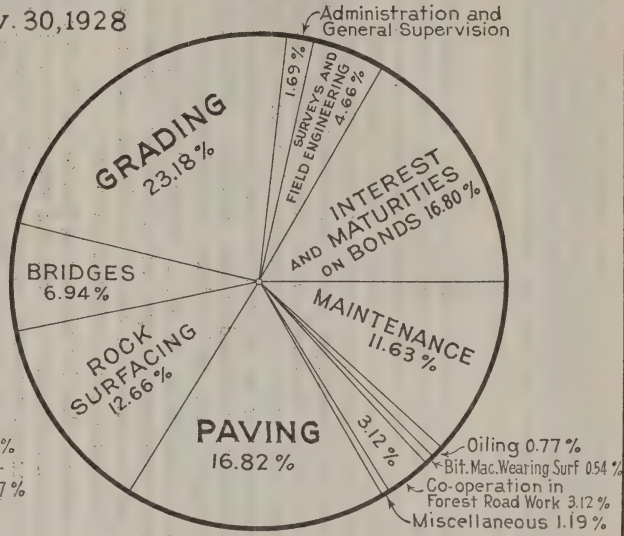
REVENUES AND EXPENDITURES

Graphic presentation of the relative amounts of revenue derived from different sources and the relative amounts expended for different purposes.

TWELVE YEAR PERIOD
Dec. 1, 1916 to Nov. 30, 1928



REVENUES



EXPENDITURES

in the road itself requiring slow speed and caution on the part of the driver, such as curves, etc. Square signs are used to indicate any condition requiring caution which is not inherent in the road itself, but which is due to adjacent conditions such as schools, etc. Rectangular signs of various dimensions are used to give directions and convey information to the driver.

All signs of a precautionary character, including the circular railroad sign, the octagonal stop sign, the diamond caution sign, and the square caution sign, have black lettering and borders on a yellow background. All direction signs are black on a white background. Adoption of these signs by all the states will result in a uniform sign system which should be of distinct advantage to the tourist and a safety measure to all. In time, these signs should be as well known as the familiar railroad crossing "saw buck" signs. The placing of distance and direction signs has been continued for the information and convenience of the traveler. Also, signs marking rivers and creeks, mountain summits and elevations, historical locations, etc., will be found on all highways.

The United States routes, a system of transcontinental and interstate highways, have been designated by number. These routes are indicated by the familiar black and white United States shield marker indicating the name of the state and number of the route.

The general plan for numbering was to use the even numbers beginning at the Canadian border for east and west routes and the odd numbers for the north and south routes, beginning on the Atlantic Coast. In this state we have No. 30, the Columbia River Highway and Old Oregon Trail, a part of a through route from the Atlantic to the Pacific, and No. 28 beginning at Ontario and passing through Central Oregon to the Coast. No. 101 is the Roosevelt Coast Highway extending through Washington, Oregon and California; No. 99 is the well-known Pacific Highway from the Canadian boundary to Mexico; while No. 97 begins at Ashland, runs east to Klamath Falls, north to Bend and Biggs, then north to the Canadian line through Central Washington; No. 199 is the Redwood Highway from Crescent City to Grants Pass.

The whole purpose of the route-numbering system is to clearly mark the through routes for the convenience and information of the traveler and to avoid the confusion caused by indirect and overlapping routes promoted by unprincipled roads and trails organizations. It is expected that legitimate marked routes, such as the Lincoln Highway, Old Oregon Trail, Columbia River Highway, Pacific Highway, etc., will continue to retain their identity and the use of these established names.

In previous years, concrete mile posts were set on the Pacific Highway, West Side Pacific Highway, Upper and Lower Columbia River Highways and Old Oregon Trail. Continuing this program, in 1927 concrete mile posts were set on The Dalles-California Highway from the Columbia River to the California state line. Temporary wooden mile posts have been set on some other highways. These mile posts become an informative guide to the traveling public but are also necessary in designating maintenance operations. All structures are likewise designated by mileage distance from the point of beginning.

State highway right-of-way lines on projects completed recently have been marked with iron pipe or pins and white posts. This will definitely mark the boundaries and will prevent encroachments by private owners in future years.



MARKET ROADS. TOP—IN LINN COUNTY; CENTER—IN UNION COUNTY; BOTTOM—IN BENTON COUNTY

In the biennium under review, the development of the county system of market roads under the supervision of state highway commission has continued.

In that period, the sum of $2,235,093.81 was raised by the state levy and $2,469,785.86 was raised by the county levies for market road purposes. Using balances on hand at the beginning of the period and other county funds from various sources, the total expenditures was $6,680,-663.42. Market road levies have been made by every county in the state each year. Of the total apportioned to the counties outside Multnomah, that county has contributed as the so-called Multnomah surplus the sum of $589,128.47 in the two years. Since the Market Road Law became effective 2,477 miles have been graded, 1,990 miles have been surfaced and 249 miles have been paved; $709,288 of market road funds have been expended for maintenance; $318,430 have been used by the counties for cooperation on forest highways; $479,235 on major bridges, and $1,084,342 as cooperation with the state. This indicates the magnitude and importance of the market road program.

Details of the supervision over market roads, with which the Commission is charged by an act of the legislature, are attended to by the market road engineer under the direction of the state highway engineer. His activities have, in general, been consultation with county courts and county engineers with respect to location and construction, including under the latter head the matter of specifications and methods. Coming into contact as he does with market road undertakings in every part of the state, he accumulates information on many and varied problems in one county or another which is frequently of value in helping to solve like problems in other counties. This supervision is bringing about throughout the state a desirable uniformity of standards and is helping to coordinate the general road system of the state as distinct from the state highway system. Continuation of the Oregon market road plan will give ultimately a well-balanced system of state and county roads, providing good road facilities for every part of the state and its counties.

All purchases of motor vehicles, road machinery, equipment, gasoline, lubricating oils, tires and all materials and supplies are made through the State Board of Control after bids have been submitted in the usual form. The equipment engineer keeps performance records and maintenance costs of all equipment purchased and is in a position to advise and recommend to the Board on purchases affecting the Highway Department. All equipment is charged out for the time it is used on a fair rental basis so that each construction project, maintenance operation or survey is charged with a proper proportion of the cost. The rental rates are designed to cover the cost of an annual overhaul and depreciation. Supplies are charged direct to the job.

The main shops for the repair and maintenace of business cars, trucks, tractors, graders and other types of road equipment are located at Salem on state property. Branch shops were constructed in the previous biennium at Coquille and Klamath Falls to serve Southern Oregon. A branch shop has been maintained for some years at La Grande in rented quarters which were very inadequate. It was necessary to make a change and the city of La Grande generously offered the major part of the cost of a 4.8 acre site if the Commission would build new shops in their city. The offer was accepted since La Grande was a central location for handling Eastern Oregon equipment. Construction was commenced in the spring

of 1928. This property has frontage on the Old Oregon Trail and abuts in the rear on the main line of the Union Pacific Railroad, from which a spur track has been constructed. These shop buildings were completed in the fall of 1928 together with a one-story office building for the division engineer, who formerly had rented quarters in La Grande. The increased efficiency of employes and better facilities for handling work in the new buildings, as well as savings in rentals will be reflected in operating costs. These three branch shops repair and service all equipment in their territories and save transportation and time as well as relieve congestion at the main shops.

In recent years, a large part of the surplus war equipment consisting of trucks, tractors, etc., allotted to the state at the close of the war by the Government for road building purposes, has been taken out of service because obsolete and wornout, hence a considerable expenditure has been necessary for replacements. The new equipment, however, is more efficient and better adapted to the needs of the department.

Patrol maintenance sheds have been built at Prineville, Bend, Chemult, Government Camp, Sand Creek (Klamath County), Austin and Goldson, to facilitate maintenance operations. At many other points, storage sheds are rented.

A new piece of equipment which has been placed in operation this year is a road magnet mounted on a truck. In six months time, this truck traversed practically all of the state highway routes and picked up many thousand pounds of metal, a large proportion of which would be productive of tire punctures.

The necessity of maintaining all highways up to a high standard is apparent to all. On pavements cracks must be filled, breaks repaired, depressions filled, shoulders rebuilt, etc. On oiled macadam roads, frequent patching may be found necessary where soft spots develop in the subgrade. On untreated crushed rock or gravel surfaced roads, dragging must be done at the proper time to maintain a smooth riding surface. In addition, ditches and culverts must be kept open, slides removed, weeds cut, papers and litter picked up, guard fences repaired and repainted, bolts in bridges tightened, timber bridges renewed, steel bridges repainted, stream channels cleared, etc.

For the repair of bituminous pavements, portable paving plants are operated during the summer season. Corrugations are removed without resurfacing by heating with burners designed for that purpose followed by raking and rolling while the surface is still hot.

Snow removal on the main highways is an important part of the maintenance program, so that the public may secure the maximum use of the highways and so that delays and congestion may be avoided. The Pacific Highway over the Siskiyou Mountains has been kept open for travel for eight successive seasons, and, likewise, over the Old Oregon Trail there has been no interruption to travel over the Blue Mountain Summit for a five-year period. Also, the Austin and Service Creek Summits on the John Day Highway have been kept open for several years. On The Dalles-California Highway, the greatest snowfall occurs at Sun Creek Summit north of Fort Klamath but this has been handled with heavy equipment. There is also considerable snowfall on the Ashland-Klamath Falls Highway but there has been no interruption to traffic.

The Mt. Hood Loop has been kept open between Rhododendron and Government Camp for two seasons, and last winter (1927-28) the Hood River side was kept open from Parkdale to a point beyond the Forest Boundary. Winter sports have been developed to a remarkable degree at Government Camp and this has brought heavy traffic over week-ends. To provide parking space, the roadway east of Government Camp was graded 80 feet wide for a distance of half a mile.

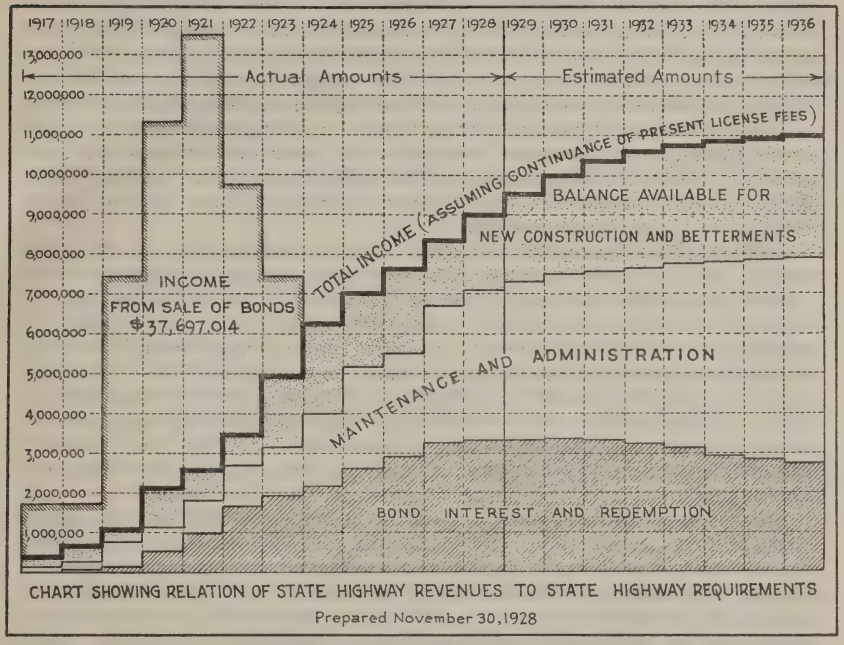


CHART SHOWING RELATION OF STATE HIGHWAY REVENUES TO STATE HIGHWAY REQUIREMENTS

Prepared November 30, 1928

A severe snow storm blocked the Columbia Gorge in Hood River and Multnomah Counties on New Year's Day in 1928. To clear the highway in Hood River County and augment the county equipment in Multnomah County, trucks and tractors with plows were moved in from Eastern Oregon, Salem and the Mt. Hood Loop. Large numbers of day laborers were also employed.

Snow removal equipment has been improved and developed rapidly within a few years. The new units mounted on pneumatic tired trucks are much more mobile and efficient than previous models. This equipment is stationed at strategic points throughout the state so as to be available on short notice when needed. In several sections of Easern Oregon, permanent and portable snow fences have been erected at locations subject to drifts.

The oiling program, begun in a small way in 1923, has been continued until on this date there are 1,100 miles of oiled macadam and over 100 miles of bituminous macadam, which has reduced the untreated crushed rock or gravel surfacing to about 1,400 miles. Oiled macadam is divided in two classes, light and heavy. Light oil is applied mostly as a dust palliative on units where there is little base rock or other conditions which

make resurfacing necessary. Its effect is temporary. Heavy oil is placed on sections where there is a good thickness of macadam sufficient to support the traffic. Its effects are more lasting. Screenings are added to heavy oil which gives a thickness of not less than an inch. Bituminous macadam is a still higher type, two inches or more in thickness, built up of layers of stone penetrated by heavy oil. All oiled macadams are considered a maintenance feature, but bituminous macadam, being of a greater thickness, is classed as a betterment. These oiled surface treatments give a hard, smooth and dustless surface to macadam roads which resembles pavement, but it should be remembered that it is not pavement but rather an intermediate type of surface designed to fill the gap between untreated crushed rock or gravel road surfacings and standard pavements.

Oiled macadam is particularly adapted to Central and Eastern Oregon where climatic conditions are favorable, but good results have also been secured in Western Oregon despite the heavy rains of the winter season. However, in the latter instance, heavy oil has not been applied except where heavy bases had been laid.

The rapid deterioration of crushed rock or gravel roads under heavy traffic, with the accompanying dust nuisance, has been apparent to all. Careful observation showed a loss in thickness of surfacing material in excess of an inch a year. The replacement of this material requires the resurfacing of the project every five years; therefore, divided into yearly periods, the amount to be charged to maintenance is one-fifth of the total cost which should be added to the cost of regular patrol maintenance. Hence, the logical use of oil to bind the road surface and save the loss of road materials, in other words, to seal in the rock for the purpose of preserving the stability of the road and take the wear on the surface of screenings.

Oiled surfaces are generally much smoother than the best maintained untreated macadam roads. By reason of the smoother surface, experiments readily demonstrate an immense saving in tire wear, one authority placing the figure at one-thirteenth the amount of wear as compared with rough, untreated macadam. It is also a well-known fact that, due to easier traction on the oiled surface, there is a saving in motor fuel. Maintenance of unoiled macadam requires continuous treatment with heavy blade equipment, while oil patching requires only a light truck when the work is needed, hence a substantial saving in patrol maintenance.

Worthy of note is the non-skid characteristic of oiled macadams as compared with bituminous pavements. This led in 1927 to an experimental mile placed on the Pacific Highway at Aurora. This present year, ten miles were laid on the Lower Columbia River Highway. The sections selected for treatment were on sharp curves or sheltered spots which were frequently wet or frosty. Thus far, this treatment has proved very satisfactory and a larger mileage is anticipated for next year. In 1926, gravel shoulders on the Pacific Highway between Aurora and Salem were treated with oil and screenings which have been easily maintained and which have added, in effect, four feet to the width of the pavement.

A careful compilation of costs for the year 1928 indicates that the average cost of heavy oil treatment was $1,130 per mile without rock, and $1,481 per mile with rock included. This gives a thickness of about one inch. With a lesser maintenance cost and a credit for the replacement cost of lost materials, but not capitalizing its advantages, the figures thus far available indicate a saving in excess of ten per cent in annual costs in favor of oiled macadams over untreated macadams.

Oiling operations have been objectionable to the motorist, of course. However, methods have been developed which have greatly improved previous conditions. Where available, detour or alternate roads have been used. When light oils were used for the prime coat only, one-half of the road was oiled at a time, giving one dry side for travel. Heavy oils also have been applied one-half width at a time, but have been always immediately covered and traffic allowed to pass over with very little delay. Likewise, bituminous macadam and non-skid treatment has been placed in a similar manner with little or no inconvenience to traffic.

Two meetings were held at Falls City in the spring of 1927 to consider the petition of interested citizens to form the Falls City-Valsetz Highway Improvement District. The petition was rejected because the boundaries of the proposed district included a large amount of property which could not have access to the road and because the benefit of the road did not appear to justify the high cost of construction.

Two highway improvement districts, previously organized under the provisions of Chapter 399, Laws of 1921, are in a healthy condition. The Umpqua Highway Improvement District was formed at an election in February of 1925. Its funds have been raised by taxation and used in cooperation with the state on the Roosevelt Coast Highway between Reedsport and the Coos county line. In 1928, the district funds were matched by Douglas County and both were used in cooperation with the Government on a reinforced concrete bridge across the Umpqua River at Scottsburg, designs for which were made by the State Highway Department and the contract awarded by the Commission. This structure will be completed in July of 1929 and will make unnecessary further use of an inadequate ferry. At the November, 1928, election, this district voted bonds in the total sum of $100,000, with which, supplemented by county funds and federal aid, they expect to complete a substantial part of the project.

The Salmon River-Grande Ronde Highway Improvement District was organized as the result of an election held in May, 1926. Bonds to the amount of $125,000 were issued and the proceeds used to purchase right-of-way and grade between New Grande Ronde and the Polk-Tillamook County line. This contract was awarded by the State Highway Commission and the construction supervised by the engineering department. Forest funds have been expended in grading west from the Polk-Tillamook County line to the east end of the improved county road in Lincoln County, a total distance of six miles. Surfacing is needed on both of these units.

At the time of the preparation of the last biennial report, reference was made to court cases then pending which were of special interest to the state. One of these cases was entitled "Martine et al. vs. Kozer," the other "Anthony et al. vs. Kozer." These cases were then pending on appeal in the United States Supreme Court. They have since been decided adversely to the plaintiffs. The first case mentioned challenged the constitutionality of the Oregon Motor Vehicle License Law; the other case challenged the validity and constitutionality of the Oregon Gasoline Tax Law. The cases were first heard by the Federal Court sitting in Portland, which court in each instance upheld the validity of the statute. The United States Supreme Court refused to consider them on appeal.

Since the filing of the last biennial report, there have been instituted several other cases of special interest. Some of these cases have been disposed of and some are still pending. Brief mention only will be made of these at this time.

The cases of Haymaker vs. Klamath County and the State Highway Commission was a case in which the authority of the Highway Commission to locate and improve a certain highway was challenged. The trial court dismissed the complaint as to the Highway Commission, holding that the question of the location of state highways has been committed by the legislature to the judgment of the Highway Commission.

The case of United Contracting Company et al. vs. State Highway Commission is of unusual interest for the reason that there is involved in that case the question of the right of a private citizen or corporation to sue the State without the State's consent. This question has been decided by the trial court adversely to the State and ultimately will be taken to the State Supreme Court.

Another case of more than passing interest is the case of Guy C. H. Corliss as administrator of the estate of Albert D. Jones, deceased, plaintiff, vs. H. B. Van Duzer. In this case the administrator of the estate seeks to recover damages from Mr. Van Duzer as a member of the Highway Commission. The deceased was killed as a result of the automobile which he was driving going over an embankment on one of the state highways. It is claimed by the plaintiff that the employes of the highway department were negligent in not properly policing highway construction which was being carried on where the accident occurred, and it is sought to impute to Mr. Van Duzer, as chairman of the State Highway Commission, the alleged negligence of State Highway employes. The purpose of the suit is to recover from Mr. Van Duzer personally and not officially. This case is pending in the State Supreme Court, the trial court having decided in favor of Mr. Van Duzer.

Traffic counts are regularly made at monthly intervals during the summer months to secure definite statistics as to the number of vehicles using the roads. In 1928 traffic counts were taken on one day each month in the year so as to secure data on winter traffic as well. The stations have been selected with a view to securing representative averages rather than large counts. A typical example is shown for a sixteen-hour count, 6 a. m. to 10 p. m., on the same approximate date, also on the same day in the week in the month of July for the years 1921-1928, inclusive. These counts are indicative of through travel, being taken at points not influenced by local travel.

	1921	1922	1923	1924	1925	1926	1927	1928
Pacific Highway near Wolf Creek:								
Nonresident	151	268	583	678	827	891	957	909
Resident	168	160	240	337	279	359	375	471
Total	319	428	823	1,015	1,106	1,250	1,332	1,380
Columbia River Highway 15 Miles West of Pendleton:								
Nonresident	63	139	275	344	364	306	409	432
Resident	139	169	231	288	225	261	315	378
Total	202	308	506	632	589	567	724	810
Old Oregon Trail at Meacham:								
Nonresident	38	87	104	273	261	304	290	286
Resident	98	86	70	320	227	270	253	239
Total	136	173	174	593	488	574	543	525

The percentage of each class of traffic made by average counts taken in June, July, August, September and October at 200 representative counting stations scattered over the state is as follows:

	1923-24	1925-26	1927-28
Horse drawn	1.33	0.62	0.32
Motorcycles	0.72	0.47	0.41
Oregon passenger automobiles	69.42	70.76	69.74
Nonresident passenger automobiles	20.85	20.74	20.85
Trucks 1.5 tons and under	4.14	4.77	5.48
Trucks over 1.5 tons	3.54	2.64	3.20
	100.00	100.00	100.00

Both the Secretary of State and the Highway Commission are authorized by law to employ traffic officers. To avoid duplication of effort and harmonize the work of the two departments, these men were placed under one head several years ago and this arrangement has been continued. At the present time the personnel is as follows: One chief, two captains, three lieutenants and an average of thirty officers. Both departments are represented by an approximately equal number of officers except that under the provisions of the law the commissioned officers are carried as employes of the Secretary of State. State Highway Commission employes are paid from the state highway fund while the Secretary of State employes are paid from the motor vehicle fund. Many of the Commission's engineers and maintenance employes are deputized to enforce traffic laws in emergencies. They receive no extra compensation for this work.

The protection of the roads against overloaded trucks and damage by cleated tractors requires constant vigilance. Oiled surfaces are particularly vulnerable to the latter. Traffic officers are provided with portable scales to weigh up trucks which are suspected of violating the laws. In addition to the platform scales on the roadside at Canemah, placed several years ago and in continuous use ever since, the Commission this year installed a platform scale south of Tillamook for the purpose of checking up log haulers who are inclined to load their trucks in excess of the legal limits and have caused some damage to the roadway between Tillamook and Beaver.

Log hauling on state highways is permitted only by special permit as provided by law. These permits are granted only after investigation of the route proposed to be hauled over and the posting of a bond to guarantee faithful compliance with the terms of the permit and payment for any damage in excess of ordinary wear. Permits are issued for the calendar year only. A total of 210 permits were issued in 1927 and 250 in 1928.

Overloads, coupled with insufficient rubber in solid tires, are very damaging to pavements and macadam surfaces, while overloading, combined with excessive speeds, sets up impact stresses which are exceedingly damaging to the lighter types of paving.

The increasing use of pneumatic tires on light trucks, and likewise the introduction of dual tires, has made the use of solid rubber tires no longer necessary for the heavier loads, which is a saving factor in highway maintenance and upkeep.

It is interesting to note that investigation has disclosed that the rhythmic corrugations found on crushed rock and gravel roads are caused by light cars with high pressure tires and without shock absorbers. The use of shock absorbers tends to greatly decrease the tendency to form

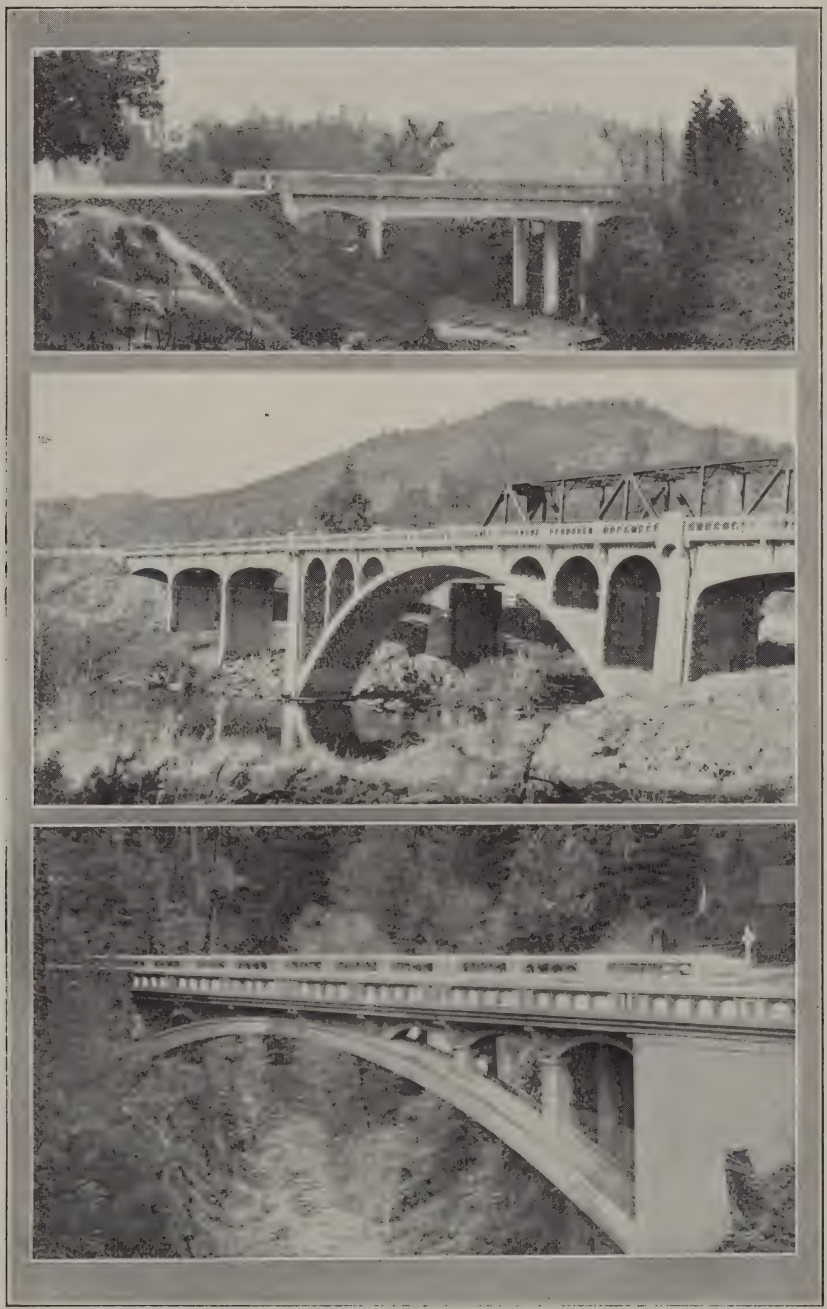
corrugations, and the same vehicle equipped with balloon tires, with or without shock absorbers, at the same speed and on the same road, failed to make any corrugations. The popularity of balloon tires may solve another serious maintenance problem.

The elimination of railroad grade crossings is a part of the state highway program. This may be done by structures to separate the grades or by relocation of railroad or highway. At Wren, on the Corvallis-Newport Highway, an overhead structure has been completed. In the construction of the Roosevelt Highway in Tillamook County, the old road was relocated so as to eliminate four grade crossings of the main highway and two grade crossings of side roads within a distance of seven miles between the Miami River and Watseco. All surveys for highway locations are made with a view to crossing railroad tracks on separated structures or to avoid crossings by keeping the locations on one side or the other of the railroad where topographic conditions permit.

All public utilities which desire to place pole lines or pipe lines on the state highway right-of-way are required to secure permits or franchises. These franchises are issued only after satisfactory arrangements have been made for the proper location of poles or pipe lines so as not to interfere with maintenance operations or future widening. The rapid expansion into rural communities of facilities for furnishing light and power and telephone service, as well as the connection of important power plants and long distance telephone leads has increased the demand on the highway rights-of-way for space. It has been the Commission's practice to reserve one side of the highway for light and power companies and the other for telephone and telegraph use. New lines are required to take care of existing lines by relocation so as to remain on one side of the road and avoid crossing and recrossing. Also, the use of common user poles is required where possible; 106 pole-line and 65 pipe-line permits were granted during the two-year period.

The great need for wider rights-of-way is everywhere apparent. Under the Oregon law the necessary rights-of-way were secured by the counties. In most cases the important state highways were located along the existing county roads. Some betterments in alignment were made and the new right-of-way was secured 60 feet wide, but along the old roads, in many cases, there is no recorded width, and fences have been permitted to encroach for many years, and improvements to build up close to the road so that in very many instances not more than 50 feet is available, and in some cases as little as 40.

With the rapid expansion of the utilities to whom the law gives the right to occupy a part of the right-of-way, and the need for sidewalks in the suburban districts to keep pedestrians off the traveled way, these narrow rights-of-way become insufficient for their original purpose, the roadway itself. The rapid increase in traffic has necessitated wider pavements and wider rock surfacing together with a sufficient shoulder to provide space for vehicles to park off the traveled way. Further, the necessity of space for drainage and the maintenance of shoulders and ditches by the use of power equipment is a factor to be considered. The cost of securing narrow strips of right-of-way along the present highways will be great in view of the improvements made to abutting property. For these reasons, the Commission has made it a rule to require a minimum of 80 feet for all new highway rights-of-way, believing that it is necessary to provide ample width for future requirements.



TOP—FOOTES CREEK BRIDGE ON PACIFIC HIGHWAY IN JACKSON COUNTY; CENTER—ROGUE RIVER BRIDGE ON PACIFIC HIGHWAY AT GOLD HILL; BOTTOM—SOAPSTONE CREEK BRIDGE ON ROOSEVELT COAST HIGHWAY IN CLATSOP COUNTY

During the winter months, the Commission has made it a policy for several years to reduce the load limits on certain highways in Western Oregon where subgrade conditions are affected by the extremely heavy rainfall. The load limits in these cases have been reduced to three-fourths of the normal limits which has worked out satisfactorily. In Eastern Oregon it has been the policy to place load limits at some points for a short time only when the frost was going out of the ground in the spring or when affected by alternate freezing and thawing conditions.

The administration and general supervision charges, including surveys, construction and maintenance engineering and all overhead costs, have totaled, in the biennium, 5.52 per cent of the total expenditures, not including market road disbursements, as compared with a general average of 6.35 per cent for the 12-year period. Excluding bond interest and principal payments, the average for the biennium is 8.14 per cent of all other expenditures.

By resolution adopted by the 1927 legislature, the Highway Commission was requested to build some of the so-called "desert type" road on the Central Oregon Highway between Bend and Burns. This type of road is constructed by the use of a tractor and blade grader and the grade line follows the general contour of the ground. Twenty-seven miles of this type of road were completed between Millican and Hampton. Some small sections of rock work and some team work were necessary but the total cost averaged $2,200 per mile. Due to the character of the soil and the small amount of traffic, no surfacing was found necessary. There are other sections on this highway where this same type of construction may be followed. There are other units, however, where side hill and scab rock work will be encountered which will greatly increase the average per mile cost.

Seeking to take advantage of the provisions of Chapter 288, Laws of 1925, known as the private toll road act, an application was filed by residents of Umatilla and Pendleton for a franchise to construct a privately-owned toll road along the Columbia River between Umatilla and Wallula, the section in Oregon being 20 miles in length, with six miles in Washington. The application was rejected, the Attorney for the Commission holding that the toll road act did not apply to highways on the state highway system and that further federal aid on connecting roads in both states might be endangered. The Commission feels that this act is contrary to public policy and would recommend that it be repealed.

The legislature of 1927 passed an act (Chapter 301) authorizing the Oregon State Highway Commission to purchase or otherwise acquire Multnomah County's interest and share in the Interstate Bridge over the Columbia River at Vancouver, and make it a free bridge, provided similar arrangements were made by the state of Washington to acquire Clark County's interest. Negotiations were conducted with the Board of County Commissioners of Multnomah County, and an agreement was made whereby the Commission will pay a sum not to exceed $125,000 to Multnomah County. In the operation of the bridge since the opening in 1917, Multnomah County has received three-fifths of the toll revenues after deduction of operating expenses. This has been sufficient to pay all interest and principal due on bridge bonds as well as set up a sinking fund to retire all outstanding bonds at maturity. In addition, there was a considerable sum available for widening the grade, widening pavement and constructing a concrete structure at Columbia Slough on the Denver

Avenue approach but not sufficient to complete the project. It is estimated that the amount needed will not exceed $125,000, hence this figure has been agreed upon as the amount the state shall pay to Multnomah County. The state of Washington, by legislative act, was directed to pay Clark County $250,000 for its interest in the bridge.

Three meetings were held with the Washington State Highway Committee and the details and arrangements for taking over and operating the structure agreed upon. It was decided that the agreement would become effective at midnight, December 31, 1928, and that thereafter all traffic would pass over free, except that franchise fees for street cars, cables, etc., would be charged. After deducting income from this source, the operation, maintenance and betterment costs of the Columbia River structure from the north shore of Hayden Island to the north bank of the Columbia River, including the north end approach, would be divided equally between the states of Washington and Oregon. By agreement with Multnomah County, the Oregon Commission will take over from Multnomah County and assume the maintenance of the roadway from the south end of the main structure at Hayden Island to the junction of Union and Denver Avenues, including the bridge over Oregon Slough, without further expense to Multnomah County.

In order to simplify and designate by a more appropriate name, highway No. 19, formerly designated as the Prineville-Lakeview Highway, was changed to the Fremont Highway when the location of the northern end of this highway was shifted to connect with The Dalles-California Highway near Lapine. By resolution adopted November 13, 1928, the name Willamette Valley-Florence Highway, No. 34, was abandoned in favor of a new name, Siuslaw Highway, the name being appropriate because the new location follows the Siuslaw River on the west end for many miles.

The Commission views with much concern the increasing number of accidents each year on the state highways, involving loss of human life, injuries to persons and damage to property. It is peculiarly significant that many accidents are happening at points where highways have been constructed for some years with no previous accidents reported. The conclusion must be drawn that fast driving or carelessness is responsible. Most accidents occur on curves, where cars going at high speeds are unable to make the turn. A flat or long radius curve driven at moderate speed becomes in effect a sharp or short radius curve at high speeds. It is evident also that curves super-elevated for the legal rates of speed are not banked sufficiently for excessive rates of speed. As fast as funds can be spared, curves on main highways are being flattened and the super-elevation increased but this involves much work and large expenditures. It can not be done at once, nor in a few seasons. In the meantime, guard rails have been placed on many curves not previously protected, shoulders have been widened and super-elevated, nonskid treatment has been applied to asphalt surfaces, screenings have been spread in wet or frosty weather, traffic strips have been painted, and large curve and slow signs have been erected. The rest is up to the motorists. Caution is the first rule of safety.

The report of the Engineer, which follows, gives in detail the various constructive projects undertaken and expenditures made during the biennial period. It will be noted that progress has been made and the program advanced but that there are still many gaps to be filled and

extensions and connections to be made to properly serve all parts of the state. Particular reference is made to the uncompleted portion of the Roosevelt Highway on the coast between Newport and Gardiner, the Ochoco Highway between Mitchell and Dayville, and the Central Oregon Highway between Bend and Burns.

The Commission desires to express its appreciation of the helpful cooperation given by officials of the United States Bureau of Public Roads and the Forest Service in handling the many details of federal aid and forest cooperative work. The thanks of the Commission are due other state officers for many courtesies and assistance rendered. Acknowledgment is also made of close cooperation with the county courts in the construction program. Nor is the Commission unmindful of the continued support of the state highway program given by the people and the press of the state.

STATEMENT OF RECEIPTS AND DISBURSEMENTS THROUGH STATE HIGHWAY FUND

December 1, 1926, to November 30, 1928

This statement includes only those receipts and disbursements which have been handled through the State Highway Fund. For complete statements of the revenues and expenditures of the State Highway Commission see Part Three of this report.

RECEIPTS

Balance on hand December 1, 1926:			
Cash (including $75,000 in Revolving Fund)	$ 790,912.31		
Uncashed warrants	79,495.67		
		$ 870,407.98	
Motor Vehicle License Fees, 1927	4,620,000.00		
Motor Vehicle License Fees, 1928	4,926,609.20		
		9,546,609.20	
Gasoline and Distillate Tax, 1927	3,887,655.24		
Gasoline and Distillate Tax, 1928	3,657,288.38		
		7,544,943.62	
Motor Transportation Fees, 1927	49,854.21		
Motor Transportation Fees, 1928	98,302.35		
		148,156.56	
Federal Aid, 1927	1,111,521.64		
Federal Aid, 1928	582,440.20		
		1,693,961.84	
County Cooperation, 1927	279,292.39		
County Cooperation, 1928	255,798.41		
		535,090.80	
Miscellaneous Cooperation, 1927	52,680.85		
Miscellaneous Cooperation, 1928	26,973.39		
		79,654.24	
Interest on Bank Balances, etc., 1927	46,053.35		
Interest on Bank Balances, etc., 1928	19,939.31		
		65,992.66	
Fines for Traffic Law Violations, 1927	23,716.20		
Fines for Traffic Law Violations, 1928	19,256.85		
		42,973.05	
Revenues from Sales and Rentals, 1927	110,131.66		
Revenues from Sales and Rentals, 1928	89,917.18		
		200,048.84	
Total receipts (including uncashed warrants)			$20,727,838.79

DISBURSEMENTS

New Construction (State share only)		$ 1,899,988.19
Major Additions and Betterments (State share only)		422,153.20
Minor Additions and Betterments (State share only)		942,903.38
Special Maintenance (State share only)		1,588,549.32
General Maintenance (State share only)		4,738,762.95
Cooperation in Forest Road Work (State share only)		250,943.85
Rights of Way, Patrol Stations, Etc.,		121,416.79
Operation of Draw Bridges and Ferries		44,217.39
Parks and Timber Preservations		109,183.12
Enforcement of Traffic Laws		123,390.01
Interest on Bonds		3,249,276.86
Maturities on Bonds		3,350,000.00
Equipment and Supplies:		
Gross disbursements	$2,825,391.91	
Credits from sales and rentals	2,780,468.73	
Net disbursements		44,923.18
Administration and Supervision		409,816.13
Surveys		117,746.51
Engineering County Construction		1,682.46
Miscellaneous General Expense		34,861.36
Federal Government Funds disbursed through Highway Fund		1,693,961.84
County Funds disbursed through Highway Fund		535,090.80
Funds of Miscellaneous Contributors disbursed through Highway Fund		79,654.24
Disbursements offset by credits accrued through sales and rentals		200,048.84
Total disbursements		$19,958,570.42
Balance on hand December 1, 1928		*$ 769,268.37

* This balance includes $43,500 in cooperative county warrants and $664.55 in miscellaneous county warrants. It also includes $75,000 in Revolving Fund.

RECONCILIATION OF DISBURSEMENTS THROUGH THE STATE HIGHWAY FUND WITH NET EXPENDITURES ON STATE HIGHWAY WORK

Total disbursements through State Highway Fund		$19,958,570.42
Add for payments made direct by counties	$767,214.37	
Add for payments made direct by miscellaneous contributors	5,951.23	
Total additions		$773,165.60
Deduct for disbursements offset by credits accrued through sales, rentals, refunds, etc.		200,048.84
Difference to be added		573,116.76
Net total of expenditures made upon state highway work under the direct supervision of the State Highway Commission		$20,531,687.18

STATEMENT OF RECEIPTS AND DISBURSEMENTS THROUGH MARKET ROAD FUND

December 1, 1926, to November 30, 1928

Due to the fact that the fiscal year of the Highway Department terminates during the period that the payments of the last half of the market road taxes are being received, and during the period that the fall apportionment of the state market road funds is being paid to the counties, the market road receipts and disbursements for the fiscal years as shown in this statement are not the market road receipts and disbursements for the corresponding tax years. For statements showing the receipts and disbursements of market road funds for the separate tax years, see page 64 and the market road tables which appear in Part Four.

RECEIPTS

Balance on hand December 1, 1926		$ 13,905.32	
Receipts from State Market Road Tax:			
December, 1926	$485,123.72		
May and June, 1927	555,338.77		
October, November and December, 1927	555,338.58		
May and June, 1928	562,208.27		
November, 1928	101,492.08		
		2,259,501.42	
Total receipts			$2,273,406.74

DISBURSEMENTS

Cash payments to counties		$2,235,020.90	
Services, materials, etc., furnished to counties		27,952.52	
Administration and general supervision, 1927 and 1928		31,307.92	
Total disbursements			2,294,281.34
Net deficit on December 1, 1928			$ 20,874.60

The amounts given in the above statement do not include $22,584.29 disbursed by Harney County in connection with contract market road work on the Nigger Flat-Vanderveer section of the Burns-Drewsey Market Road, which disbursement by reason of the work having been supervised by the Highway Department was recorded in the Highway Department's books.

STATEMENT OF RECEIPTS AND DISBURSEMENTS BY MONTHS STATE HIGHWAY FUND AND MARKET ROAD FUND

December 1, 1926, to November 30, 1928

The receipts and disbursements listed under the head "State Highway Fund" include only such receipts and disbursements as are handled through the State Highway Fund. They should not be mistaken for the total receipts and disbursements incidental to state highway operations as a whole.

Month	State Highway Fund		Market Road Fund	
	Receipts	Disbursements	Receipts	Disbursements
Cash on hand, Dec. 1, 1926	*$ 790,912.31	$	$ 13,905.32	$
December, 1926	656,787.62	705,525.04	485,123.72	493,262.10
January, 1927	467,727.75	330,563.42		2,128.72
February	281,250.32	304,078.38		1,308.01
March	4,300,043.33	1,873,979.35		2,189.79
April	294,271.80	464,145.28		506.06
May	415,060.97	557,686.36	393,449.92	250,461.00
June	419,175.59	533,483.81	161,888.85	298,662.39
July	438,675.52	1,016,666.86		3,055.99
August	499,495.24	670,684.69		1,485.93
September	1,485,936.53	2,392,924.01		2,860.12
October	451,450.44	632,384.83	18,992.06	6,918.63
November	501,717.74	546,114.42	449,875.02	275,457.68
December	429,320.48	408,260.13	86,471.50	268,169.70
January, 1928	297,459.35	477,565.92		1,832.25
February	241,894.89	387,892.36		839.38
March	2,864,225.14	2,057,934.88		3,401.08
April	374,149.74	485,153.43		664.68
May	398,818.61	553,066.49	308,689.02	157,708.93
June	518,106.87	751,663.21	253,519.25	399,372.41
July	412,638.10	751,364.92		1,917.44
August	524,289.61	698,859.34		2,664.75
September	2,046,766.95	2,253,465.42		2,021.62
October	1,424,497.61	742,237.12		3,940.89
November	149,001.73	362,870.75	101,492.08	113,451.79
Totals	$20,683,674.24	$19,958,570.42	$ 2,273,406.74	$ 2,294,281.34
Less Disbursements	19,958,570.42		2,294,281.34	
Balance on hand Dec. 1, 1928	*$ 725,103.82	$	$def.20,874.60	$

* Includes $75,000 in Revolving Fund, but does not include uncashed warrants on hand.

RECEIPTS AND APPORTIONMENTS OF MOTOR VEHICLE LICENSE FEES

For period from September 16, 1926, to September 15, 1928

The receipts listed in this table are the net receipts from the registering and licensing of motor vehicles, motor vehicle dealers, chauffeurs, and operators, and from other transactions incidental thereto. The collection and apportionment of these receipts is a function of the office of the Secretary of State.

County	Net Receipts Sept. 16, 1926, to Sept. 15, 1927	Net Receipts Sept. 16, 1927, to Sept. 15, 1928	Total Net Receipts Sept. 16, 1926, to Sept. 15, 1928	25 Per Cent Turned Over to Counties	75 Per Cent Turned Over to State Highway Fund	Percentage for Each County
Baker	$ 91,711.49	$ 100,685.49	$ 192,396.98	$ 48,099.25	$ 144,297.73	1.51
Benton	110,278.93	123,298.73	233,577.66	58,394.41	175,183.25	1.84
Clackamas	266,760.85	278,670.01	545,430.86	136,357.72	409,073.14	4.29
Clatsop	133,531.52	137,696.55	271,228.07	67,807.02	203,421.05	2.13
Columbia	104,317.01	112,065.60	216,382.61	54,095.65	162,286.96	1.70
Coos	177,192.21	180,768.36	357,960.57	89,490.14	268,470.43	2.81
Crook	19,607.17	21,537.11	41,144.28	10,286.07	30,858.21	0.32
Curry	15,197.31	17,839.24	33,036.55	8,259.13	24,777.42	0.26
Deschutes	102,806.15	104,876.05	207,682.20	51,920.56	155,761.64	1.63
Douglas	138,754.08	141,815.56	280,569.64	70,142.41	210,427.23	2.21
Gilliam	23,273.70	30,700.21	53,973.91	13,493.49	40,480.42	0.43
Grant	25,454.50	27,560.72	53,015.22	13,253.81	39,761.41	0.42
Harney	20,382.49	22,258.86	42,641.35	10,660.34	31,981.01	0.33
Hood River	74,789.18	70,869.22	145,658.40	36,414.59	109,243.81	1.15
Jackson	222,372.09	240,256.51	462,628.60	115,657.14	346,971.46	3.64
Jefferson	11,745.02	14,001.13	25,746.15	6,436.55	19,309.60	0.20
Josephine	68,963.50	73,500.96	142,464.46	35,616.11	106,848.35	1.12
Klamath	184,529.40	199,821.74	384,351.14	96,087.78	288,263.36	3.02
Lake	24,964.99	30,201.97	55,166.96	13,791.75	41,375.21	0.43
Lane	344,578.70	363,082.52	707,661.22	176,915.30	530,745.92	5.56
Lincoln	45,512.96	45,345.70	90,858.66	22,714.66	68,144.00	0.71
Linn	155,521.54	173,188.71	328,710.25	82,177.56	246,532.69	2.58
Malheur	44,480.21	55,817.47	100,297.68	25,074.43	75,223.25	0.79
Marion	407,105.27	445,895.74	853,001.01	213,250.24	639,750.77	6.70
Morrow	30,963.34	36,633.33	67,596.67	16,899.18	50,697.49	0.53
Multnomah	2,364,680.80	2,502,970.16	4,867,650.96	1,216,912.73	3,650,738.23	38.24
Polk	94,721.18	98,640.60	193,361.78	48,340.46	145,021.32	1.52
Sherman	28,049.09	30,818.84	58,867.93	14,716.98	44,150.95	0.46
Tillamook	77,799.44	82,787.70	160,587.14	40,146.77	120,440.37	1.26
Umatilla	171,824.80	188,620.67	360,445.47	90,111.37	270,334.10	2.83
Union	102,540.76	110,000.57	212,541.33	53,135.33	159,406.00	1.67
Wallowa	42,028.53	42,056 94	84,085.37	21,021.35	63,064.02	0.66
Wasco	87,978.70	92,256.80	180,235.50	45,058.88	135,176.62	1.42
Washington	195,143.25	207,074.43	402,217.68	100,554.41	301,663.27	3.16
Wheeler	11,646.50	14,422.33	26,068.83	6,517.20	19,551.63	0.20
Yamhill	138,793.34	150,775.84	289,569.18	72,392.30	217,176.88	2.27
Totals	$6,160,000.00	$6,568,812.27	$12,728,812.27	$3,182,203.07	$9,546,609.20	100.00

SUMMARY

Period	Distributed to State and Counties as Above	Fees Refunded	Secretary of State's Administration Cost	Total Gross Amounts Collected
Sept. 16, 1926, to Sept. 15, 1927	$ 6,160,000.00	$ 9,119.25	$355,436.19	$ 6,524,555.44
Sept. 16, 1927, to Sept. 15, 1928	6,568,812.27	3,490.25	379,898.00	6,952,200.52
Totals for two-year period	$12,728,812.27	$ 12,609.50	$735,334.19	$13,476,755.96

STATEMENT SHOWING THE AMOUNTS OF STATE REVENUES FOR STATE HIGHWAY PURPOSES THE DISBURSEMENTS FOR BOND INTEREST, MAINTENANCE AND OTHER FIXED EXPENSE, AND THE SURPLUSES AVAILABLE FOR NEW CONSTRUCTION AND BETTERMENT, 1917 TO 1930

The revenues and surpluses shown in this table do not include aid received from the federal government and from counties. Neither do they include amounts received from the sale of bonds. Approximately $1,000,000 of surplus must be available each year to match the federal aid offered to the state, and several hundred thousand dollars of surplus should be available to match county cooperation offered. Federal aid and the surplus used to match it can be used only on those highways which are included in the federal aid highway system.

Year	Motor Vehicle Registration	STATE HIGHWAY REVENUES					DISBURSEMENTS FOR BOND INTEREST, MAINTENANCE, ETC.					Surplus of State Funds
		Motor Vehicle License Fees	Gasoline Tax *	Quarter-mill Property Tax	Miscellaneous Revenues	Total Revenues *	Interest and Maturities on Bonds	Maintenance	General Administration	Other Fixed Expense	Total Fixed Expense	
Actual												
1917	48,632	$ 150,000.00	$	$219,690.98	$	$ 369,690.98	$ 5,000.00	$	$ 34,130.80	$105,455.21	$ 144,586.01	$ 225,104.97
1918	63,325	425,000.00	.....	232,151.39	.....	657,151.39	72,900.00	822.99	63,491.02	121,387.97	258,601.98	398,549.41
1919	83,332	532,418.83	290,795.49	246,883.47	15,006.60	1,085,104.39	141,099.99	15,523.31	146,753.39	473,626.23	776,002.92	309,101.47
1920	103,790	1,481,122.75	404,050.16	247,608.87	17,375.77	2,150,157.55	503,725.00	93,001.91	203,933.77	335,180.62	1,135,841.30	1,014,316.25
1921	118,615	1,624,983.02	948,509.66	.....	19,284.39	2,592,777.07	974,870.83	566,414.93	229,888.59	81,817.86	1,852,992.21	739,784.86
1922	134,566	2,358,987.02	1,127,147.73	.....	40,124.95	3,526,259.70	1,646,266.67	735,663.46	175,622.76	158,514.58	2,716,067.47	810,192.23
1923	166,412	2,902,476.56	1,792,336.96	246,452.30	50,999.70	4,992,265.52	1,921,900.00	1,050,938.70	172,293.69	5,111.11	3,150,243.50	1,842,022.02
1924	192,629	3,419,808.55	2,560,184.67	255,863.20	81,587.56	6,317,443.98	2,158,740.00	1,664,897.16	164,123.22	66,064.41	4,053,825.49	2,263,618.49
1925	216,553	3,788,533.19	2,871,160.61	275,382.12	83,119.88	7,018,195.80	2,596,267.05	2,047,983.02	176,591.53	361,506.36	5,182,347.96	1,835,847.84
1926	234,134	4,260,000.00	3,292,973.91	.....	71,930.99	7,624,904.90	2,919,761.65	2,291,745.56	187,085.86	132,001.98	5,530,595.05	2,094,309.85
1927	245,705	4,620,000.00	3,607,830.53	.....	119,623.76	8,347,454.29	3,263,215.87	3,076,422.36	215,112.26	290,755.39	6,845,505.88	1,501,948.41
1928	255,940	4,926,609.20	3,972,956.80	.....	137,498.51	9,037,064.51	3,336,060.99	3,295,107.30	194,703.87	262,448.04	7,088,320.20	1,948,744.31
Estimated												
1929	266,000	5,175,000.00	4,275,000.00	.....	100,000.00	9,550,000.00	3,328,578.47	3,500,000.00	200,000.00	280,000.00	7,308,578.47	2,241,421.53
1930	275,000	5,375,000.00	4,525,000.00	.....	100,000.00	10,000,000.00	3,343,314.70	3,650,000.00	205,000.00	300,000.00	7,498,314.70	2,501,685.30

* The gasoline tax revenues here shown have been adjusted so that each represents exactly twelve months of income. They will not, therefore, check exactly with the amounts actually received during fiscal periods as these amounts are shown elsewhere in this report. Corresponding discrepancies will appear also in the amounts shown here in the column headed "Total Revenues."

JOBS ADVERTISED AND CONTRACTS AWARDED

December 1, 1926, to November 30, 1928

Date of Receiving Bids	Contract Number	Project	Highway	Description of Work	No. of Bidders	Contract Awarded to
1926						
Dec. 22	934	Hayes Hill-Shattuck Corner	Redwood	10.65 miles grading	10	Washburn & Hall
1927						
Jan. 27	935	Seaside-Jack Horner Creek	Roosevelt Coast	10,000 cu. yds. maintenance materials	3	Motor Investment Co.
Jan. 27	.....	Redmond Section	The Dalles-California and McKenzie	5,100 cu. yds. maintenance materials	1	Bid rejected.
Jan. 27	936	Metolius Cut-off Section	The Dalles-California	0.98 miles grading	2	Wm. Endicott
Jan. 27	937	Cow Canyon-Madras	The Dalles-California	11,800 cu. yds. maintenance materials	3	Harness & Colby
Jan. 27	938	State Line-Deer Creek	Redwood	6,000 cu. yds. maintenance materials	6	Simonsen & Hefty
Jan. 27	938	Deer Creek-Hayes Hill	Redwood	4.8 miles surfacing	6	Simonsen & Hefty
Jan. 27	939	Ione-Heppner	Oregon-Washington	10,000 cu. yds. maintenance materials	3	C. T. Habekost
Jan. 27	940	Bridge over North Slough	Roosevelt Coast	40 ft. steel span and timber approaches	3	J. W. and J. R. Hillstrom
Jan. 27	941	Two bridges over Canyon Creek	Pacific	Two 71 ft. steel spans	10	O. N. Pierce
Jan. 27	942	Six bridges near Grants Pass	Redwood	Six small concrete bridges	11	O. N. Pierce
Jan. 27	943	*Bridges over McKenzie River	Lane County Road	Steel for 180 ft. span	6	Pittsburg-Des Moines Steel Co.
Jan. 28	944	Jack Horner Creek-Mohler	Roosevelt Coast	10,000 cu. yds. maintenance materials	3	Simonsen & Hefty
Jan. 28	945	Mystic Creek-Winston	Coos Bay-Roseburg	10,000 cu. yds. maintenance materials	2	A. S. Wallace
Jan. 28	946	Dillon-Quinton and Biggs-Wasco	Columbia River and Sherman	14,800 cu. yds. maintenance materials	7	M. Chandler & Co.
Jan. 28	.....	Madras-Opal City	The Dalles-California	8,000 cu. yds. maintenance materials	.....	No bids received
Jan. 28	.....	Sand Creek Hill-Williamson River	The Dalles-California	7,000 cu. yds. maintenance materials	1	Bid rejected
Mar. 3	947	La Grande-Baker	Old Oregon Trail	20,865 cu. yds. maintenance materials	5	H. J. Hildeburn
Mar. 3	948	Multnomah County Line-Beaver Creek	Mt. Hood	8,500 cu. yds. maintenance materials	5	Peterson & Scott
Mar. 3	949	Apprs. to Lewis & Clark River Br.	Roosevelt Coast	0.27 miles concrete paving	7	John Slotte & Co.
Mar. 3	950	Sand Creek Hill-Williamson River	The Dalles-California	7,000 cu. yds. maintenance materials	1	W. D. Miller Constr. Co.
Mar. 3	951	Apprs. to John Day River Bridge	Columbia River	40 lin. ft. of embankment approach	3	O. S. Bergh
Mar. 3	952	Neskowin-Hebo-Grand Ronde	Roosevelt and McMinnville-Tillamook	28,000 cu. yds. maintenance materials	5	R. W. Stevenson
Mar. 3	953	The Dalles-Dillon-Dufur	The Dalles-California and Columbia	9,000 cu. yds. maintenance materials	2	M. Chandler & Co.
Mar. 3	954	Bridge over Rock Creek	Alsea	Four 30 ft. concrete spans	6	Clackamas Constr. Co.
Mar. 4	.....	Unpaved portion Albany-Corvallis, etc.	Albany-Corvallis and Pacific	0.6 miles concrete paving and 1,675 sq. yds. widening	1	Rejected
Mar. 4	955	Beaver Creek-Rhododendron	Mt. Hood	20,000 cu. yds. maintenance materials	2	Newport Construction Co.
Mar. 4	956	Pistol River-Chetco River	Roosevelt Coast	Removing slides	3	Washburn & Hall
Mar. 4	.....	Redmond Section	The Dalles-California	5,100 cu. yds. maintenance materials	.....	No bids received
Mar. 4	.....	Madras-Opal City Junction and Metolius Cut-off	The Dalles-California	1.0 mile surfacing and 8,000 cu. yds. maintenance materials	2	Bids rejected

Mar. 4	957	Siletz Bay-Otter Rock	Roosevelt Coast	12.75 miles surfacing	3	Greenwood & Dann
Mar. 4	958	Grand Ronde-Sheridan	McMinnville-Tillamook	24,280 cu. yds. maintenance materials	8	Motor Investment Co.
Mar. 29	959	Gaps on Albany-Corvallis, etc.	Albany-Corvallis and Pacific	0.6 miles concrete paving and 1,675 sq. yds. widening	4	W. W. Head Constr. Co.
Mar. 29	.....	Myers Creek-Chetco River	Roosevelt Coast	28.20 miles surfacing	6	All bids rejected
Mar. 29	960	Parkdale Section	Mt. Hood	10,000 cu. yds. maintenance materials	4	Doggett & Cooper
Mar. 29	961	Apprs. to Rogue River Bridge	Pacific	0.36 miles grading	8	C. Frank Rhodes
Mar. 29	962	Medford-Prospect	Crater Lake	35,365 cu. yds. maintenance materials	7	John Hampshire
Mar. 29	963	*Tillamook County Line-Grand Ronde	Salmon River-Grand Ronde Road	6.39 miles grading	9	O. D. Wolfe
Mar. 29	964	Holmes Gap Section	West Side Pacific	0.36 miles grading and surfacing	2	Earl L. McNutt
Mar. 29	965	Garibaldi-Rockaway	Roosevelt Coast	4.36 miles grading	14	Guy F. Atkinson
Mar. 29	966	La Grande-Minam	La Grande-Wallowa Lake	10.3 miles resurfacing and 16,275 cu. yds. maintenance materials	5	Joslin & McAllister
Mar. 29	967	Ferry boat for Rogue River	Roosevelt Coast	65 ft. ferry boat complete	5	St. Helens Ship Co.
April 19	968	North Unit, Myers Creek-Chetco River	Roosevelt Coast	8.18 miles surfacing	3	J. W. and J. R. Hillstrom
April 19	969	South Unit, Myers Creek-Chetco River	Roosevelt Coast	20.00 miles surfacing	4	Wren & Greenough
April 19	970	Gold Hill Section	Pacific	0.32 miles surfacing and 3,900 cu. yds. maintenance materials	4	C. L. Camp
April 19	971	Chalk Cliff-Paisley	Prineville-Lakeview	9.48 miles grading	6	John Hampshire
April 19	972	Bldg. at Emigrant Springs Park	Old Oregon Trail	Log building for park purposes	5	Frick & Belvail
May 24	.....	*Miles Bridge-Co. Line and Wingville Market Road	Baker County Market Road	7.96 miles of grading	8	H. C. Boyer
May 24	.....	Ferry Slips for Rogue River Ferry	Roosevelt Coast	Constructing ferry slips	.....	No bids received
May 24	.....	*Bridge over Pudding River	Marion County Market Road	276 lin. ft. of trestle	3	Rejected
May 24	973	Renew deck of Will. R. Br., Salem	Salem-Dallas	Paving deck with concrete	8	Linstrom & Feigenson
May 24	974	*Approach fill Will. R. Br., Newberg	Marion-Yamhill County Road	Constructing approach fill	1	Earl L. McNutt
May 24	975	*Reconstr. of Will. R. Br., Newberg	Marion-Yamhill County Road	Renew trestle, deck, etc.	3	Clackamas Constr. Co.
May 24	976	Buildings at Lava River Caves Park	The Dalles-California	Constructing caretaker's buildings	2	Luther Metke
May 24	977	Rest rooms at Viento Park	Columbia River	Constructing rest rooms	1	Kelley & Fasan
June 20	996	Buildings at Meacham	Old Oregon Trail	Pumphouse and woodshed	1	W. C. Kelley
June 23	.....	Pilot Butte Section	Central Oregon	1.41 miles surfacing	2	Rejected
June 23	979	Hayes Hill-Shattuck Corner	Redwood	10.92 miles surfacing	6	Harness & Colby
June 23	980	Lebanon-Sheas Hill	Santiam	17.24 miles grading	8	Slate Construction Co.
June 23	981	Hobsonville-Garibaldi	Roosevelt Coast	3.60 miles surfacing	6	Harness & Colby
June 23	982	Bridge over Euchre Creek	Roosevelt Coast	Three 30 ft. concrete spans	2	D. P. Plymale
June 23	983	Bridge over Hunters Creek	Roosevelt Coast	206 ft. concrete viaduct	2	C. J. Montag Co.
June 23	984	Bridge over Deadwood Creek	Siuslaw	Two 100 ft. steel spans	4	D. T. Eaton Constr. Co.
July 28	985	Reedsport-Lakeside	Roosevelt Coast	11.32 miles surfacing	6	R. E. Johnson
July 28	986	Low Pass Summit-Goldson	Siuslaw	14,000 cu. yds. maintenance materials	5	S. Simonsen
July 28	987	Mohler-Garibaldi	Roosevelt Coast	9.82 miles surfacing	5	Newport Constr. Co.
July 28	988	Bridge over Christensen Slough	Roosevelt Coast	Reinforced concrete culvert	2	O. M. Olds
July 28	989	Waldport Hatchery	Alsea	7,000 cu. yds. maintenance materials	2	C. G. McKy
July 28	990	Barlow Pass-North Forest Boundary	Mt. Hood	13,000 cu. yds. maintenance materials	4	H. G. Johnson
July 28	991	*Grand Ronde Section	Grand Ronde-Otis Road	2.05 miles surfacing	1	Motor Investment Co.
July 28	992	*Otis Section	Grand Ronde-Otis Road	1.25 miles surfacing	2	Howard McMillen
Aug. 30	.....	*Condon-Cottonwood and Condon-Lone Rock	Gilliam County Market Road	10.40 miles resurfacing	4	A. Milne

* County contract.

Jobs Advertised and Contracts Awarded—Continued

Date of Receiving Bids	Contract Number	Project	Highway	Description of Work	No. of Bidders	Contract Awarded to
1927						
Aug. 30	993	Prospect-Park Boundary	Crater Lake	17,500 cu. yds. maintenance materials	5	C. L. Camp
Aug. 30	.....	Madras-Opal City Jct. and Metolius Cut-off	The Dalles-California	1.0 mile surfacing, 11,000 cu. yds. maintenance materials	.....	No bids received
Aug. 30	994	Pilot Rock-Freewater	Oregon-Washington	8,000 cu. yds. maintenance materials	1	H. C. Schmeer
Aug. 30	995	Culvert over Allen Creek	Redwood	Reinforced concrete culvert	8	E. D. Olds
Sept. 27	997	Buchanan-Vanderveer	Central Oregon and Market Road	11.17 miles grading	7	Jetley Brothers
Aug. 30	.....	Madras-Opal City Jct. and Metolius Cut-off	The Dalles-California	1.0 mile surfacing, 11,000 cu. yds. maintenance materials	7	L. F. Ireton
Sept. 27	999	West Unit, Lowell-Goodman Creek	Willamette	3.92 miles grading	12	Baker & Scharschmidt
Sept. 27	1000	West Unit, Pendleton-Kamela	Old Oregon Trail	20,600 cu. yds. maintenance materials	10	Wren & Greenough
Sept. 27	1001	East Unit, Pendleton-Kamela	Old Oregon Trail	26,700 cu. yds. maintenance materials	10	C. R. Seitz
Sept. 27	1002	Mitchell-Keyes Creek Hill	Ochoco	7.4 miles grading	13	F. L. Brown
Sept. 27	1003	Revetment near Corvallis	Albany-Corvallis	465 lin. ft. pile revetment	5	L. Lebeck
Sept. 27	1004	Bridge over Soapstone Creek	Roosevelt Coast	108 ft. concrete arch, 40 ft. concrete approach	7	Lindstrom & Feigenson
Sept. 27	1005	Bridge over Blue River	McKenzie	720 ft. concrete viaduct	7	E. R. Metzger
Oct. 25	1006	Unity-Hereford	Baker-Unity	14.5 miles surfacing	8	Joslin & McAllister
Oct. 25	1007	Arlington-Pendleton	Columbia River	58,700 cu. yds. maintenance materials	10	Joslin & McAllister
Oct. 25	1008	Keno-Klamath Falls	Ashland-Klamath Falls	11.15 miles resurfacing, 11,200 cu. yds. maintenance materials	6	Simonsen & Hefty
Oct. 25	1009	East Unit, Lowell-Goodman Creek	Willamette	3.49 miles grading	15	Von der Hellen & Pierson
Oct. 25	1010	Bridge over Parrott Creek	Pacific	240 ft. concrete viaduct	9	Rigdon Bros.
Oct. 25	1011	Bridge over Yamhill River	McMinnville-Tillamook	100 ft. steel span, 40 ft. concrete approach	13	Clackamas Constr. Co.
Oct. 25	1012	Storage building at Prineville	Ochoco	Equipment storage building	2	John J. Cunningham
Oct. 25	1013	Storage building at Bend	The Dalles-California	Equipment storage building	2	John J. Cunningham
Nov. 7	1014	*Bridge over Mill Creek, Salem	Pacific	Four 48 ft. concrete spans	14	Lindstrom & Feigenson
Nov. 29	1015	Heppner Junction-Ione	Oregon-Washington	14,000 cu. yds. maintenance materials	10	J. W. and J. R. Hillstrom
Nov. 29	1016	Olex-Fossil	John Day	23,000 cu. yds. maintenance materials	11	H. E. Schmeer
Nov. 29	1017	Bly-Forest Boundary	Klamath Falls-Lakeview	8.01 miles grading	6	W. C. Elliott
Nov. 29	1018	Moro-Kent	Sherman	15,000 cu. yds. maintenance materials	11	A. S. Wallace
Nov. 29	1019	South Unit, Lazinka Ranch-Albee	Pendleton-John Day	6.0 miles grading	6	Rhodes & Dillard
Nov. 29	1020	Dufur-Cow Canyon	The Dalles-California	25,000 cu. yds. maintenance materials	6	J. W. and J. R. Hillstrom
Nov. 29	1021	Rock and Big Noise Creek Culverts	Columbia River	Concrete box culverts	14	Lindstrom & Feigenson
Nov. 29	1022	Bridge over Luckiamute River	West Side Pacific	100 ft. steel span, 200 ft. concrete approach	14	O. N. Pierce & Co.
Nov. 29	1023	Ash Creek Culvert	West Side Pacific	Double concrete culvert	13	O. N. Pierce & Co.

Dec. 20	1024	Klamath Falls-Merrill-Olene	The Dalles-California and Klamath Falls-Lakeview	18.70 miles resurfacing	7	John Hampshire
Dec. 20	1025	Cow Valley-Brogan	John Day	6.10 miles surfacing	3	Joslin & McAllister
Dec. 20	1026	Bridge over Wiley Creek	Santiam	100 ft. steel truss, 190 ft. trestle approach	10	Portland Bridge Co.
Dec. 20	1027	Bridge over Foots Creek	Pacific	76 ft. concrete viaduct	7	C. A. Catching
1928						
Jan. 26	1028	Alsea Mountain-Philomath	Alsea	6.0 miles surfacing, 5.9 miles resurfacing	8	H. G. Johnson
Jan. 26	1029	Canemah-New Era	Pacific	6.67 miles grade widening	9	John Slotte & Co.
Jan. 26	1030	Multnomah County Line-Beaverton	Tualatin Valley	3.0 miles grading	19	Edlefsen & Weygandt Co.
Mar. 27	1031	Riverton-Coquille-Hoffman Bridge	Coos Bay-Roseburg and Roo	42,000 cu. yds. maintenance materials	8	McGeorge Gravel Co.
Mar. 27	1032	Br. over Schofield River	Roosevelt Coast	40 ft. steel span, pile trestle approach	2	O. M. Olds
Mar. 27	1033	Br. over Willamette R. at Springfield	McKenzie	550 ft. continuous steel span, concrete approach	7	Lindstrom & Feigenson
Mar. 27	1034	Shop Buildings at La Grande	Old Oregon Trail	Three frame and two brick buildings	8	W. C. Kelly
April 18	1041	Moving building at New Era	Pacific	Moving frame building	3	W. G. H. Krueger
April 20	1035	Gardiner Summit Section	Roosevelt Coast	1.95 miles grading	10	E. L. Gates
April 20	1036	Beatty-Forest Boundary	Klamath Falls-Lakeview	21.3 miles surfacing	8	Wren & Greenough
April 20	1037	*Bridge over McKenzie River	Eugene-Coburg Road	Two 170 ft. steel spans, 171 ft. pile trestle	5	Portland Bridge Co.
April 20	1038	*Bridge over Umatilla R. at Yokum	County Market Road	130 ft. steel span	4	Kuckenberg & Wittman
April 20	1039	*Steel for Catherine Creek Bridge	County Market Road	70 ft. steel span	3	Poole & McGonigle
April 20	.....	*Wehrli Canyon	County Market Road	1.9 miles grading and surfacing	3	.....
April 20	.....	*Ramsey Canyon	County Market Road	1.9 miles surfacing	3	.....
May 29	1042	*Bridge over Umpqua River	Drain-Reedsport Road	630 ft. continuous steel span, 180 ft. concrete approach	1	Clackamas Constr. Co.
May 29	1043	Valley Junction Section	McMinnville-Tillamook	0.74 mile grading	7	Frank M. Bullis
July 10	1046	Reedsport Section	Roosevelt Coast	1.06 miles grading	5	Frank M. Bullis
July 10	1047	Ana Spring-Hunter Hill	Fremont	11.02 miles grading	10	Henry C. Boyer
Aug. 14	1048	Lebanon-Sheas Hill	Santiam	17.24 miles surfacing	14	John J. Dann
Aug. 14	1049	Deschutes River Bridge at Maupin	The Dalles-California	200 ft. steel span, 630 ft. concrete approach	3	Kuckenberg-Wittman Co.
Aug. 14	1050	Reedsport Section	Roosevelt Coast	1.0 mile surfacing	2	F. J. Kernan
Oct. 30	1051	Bridge over Agency Creek	McMinnville-Tillamook	81 ft. concrete viaduct	10	Rigdon Bros.

* County contract.

CERTIFICATE OF AUDIT

LYBRAND, ROSS BROS. & MONTGOMERY

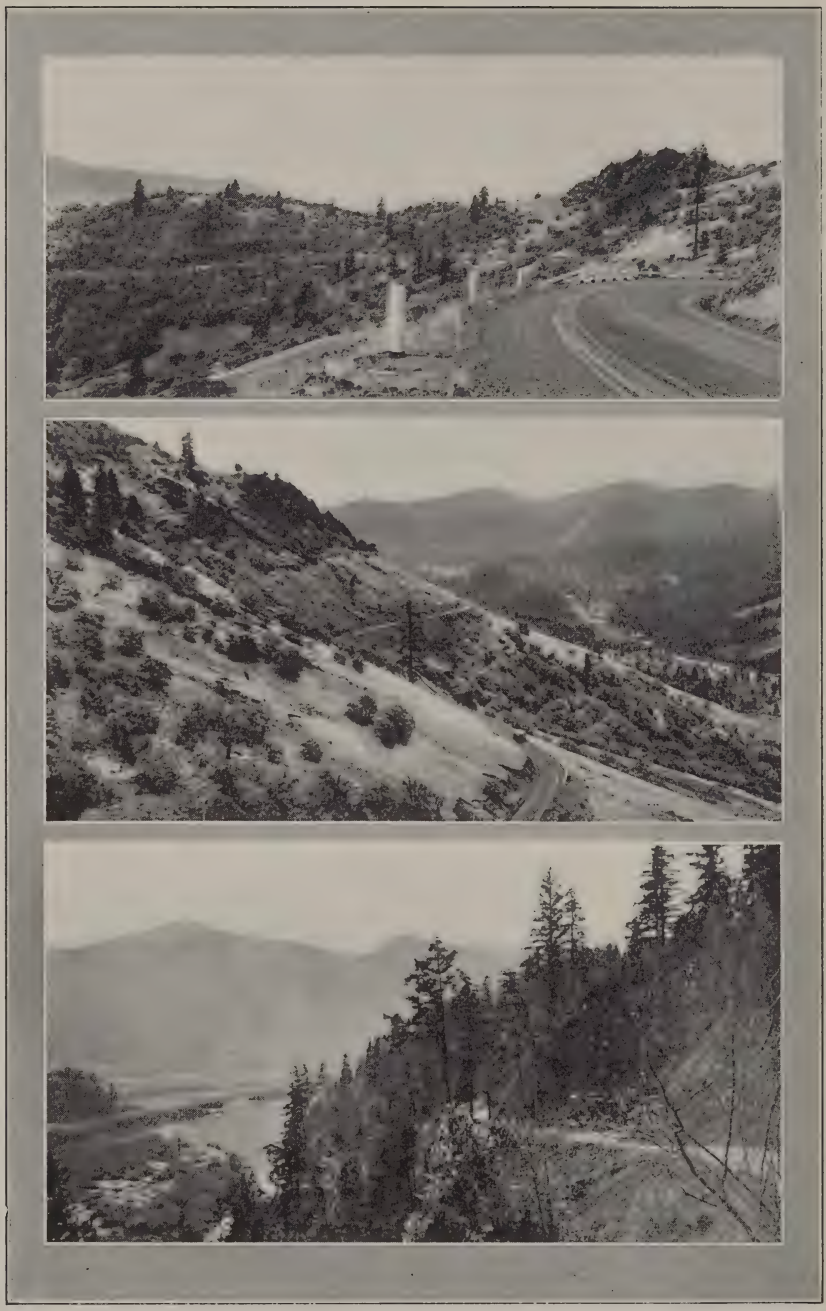
ACCOUNTANTS AND AUDITORS

Porter Building, Portland, Oregon

We have audited the records of cash receipts and disbursements of the Oregon State Highway Commission for the year ended November 30, 1927, and certify that, in our opinion, all receipts reported by the State Treasurer for that period have been properly accounted for; that all disbursements have been made under proper authority, that they have been properly recorded, and that they are supported by properly approved vouchers; and that the balances in the state highway fund and the revolving fund as at November 30, 1927, are correctly stated on the records of the State Highway Commission and that they represent funds on deposit with the bank and with the State Treasurer.

(Signed) LYBRAND, ROSS BROS. & MONTGOMERY,

Accountants and Auditors.



TOP AND CENTER—VIEWS ON THE ASHLAND-KLAMATH FALLS HIGHWAY;
BOTTOM—THE ROOSEVELT COAST HIGHWAY AND THE ROGUE RIVER

PART TWO

Report

OF THE

State Highway Engineer

TO THE

State Highway Commission

OF THE

State of Oregon

1927-1928

ROY A. KLEIN, State Highway Engineer

LETTER OF TRANSMITTAL

Salem, Oregon, December 1, 1928.

TO THE HONORABLE STATE HIGHWAY COMMISSION:

H. B. Van Duzer, Chairman.
C. E. Gates, Commissioner.
Robert W. Sawyer, Commissioner.

Gentlemen:

I have the honor to submit to you herewith, the report of the State Highway Engineer for the biennial period, December 1, 1926, to November 30, 1928.

During this period the state highway program has been advanced as fast as funds would permit, maintenance has been carried on to a consistent standard and betterments have been added where necessary and desirable. At the same time full advantage has been taken of the findings of research and experimentation in this and other states.

I take this opportunity to express my appreciation of your sincerity and earnestness in solving the many problems which constantly arise in the course of the work, and my confidence in your impartial judgment in shaping the policies for the department to follow. The work accomplished by the department is the result of the sincere and conscientious efforts of the many loyal employes with whom I am proud to be associated in this important work of planning and building highways for the great state of Oregon.

Respectfully,

ROY A. KLEIN,
State Highway Engineer.

Report of the

State Highway Engineer

TO THE

State Highway Commission

Dec. 1, 1926, to Nov. 30, 1928

PROGRESS IN STATE HIGHWAY CONSTRUCTION

During the two-year period embraced in this report, a well-balanced program has been carried on. The bond debt has been reduced. A number of new construction projects have been completed where most needed. A few widening and regrading projects have been undertaken as needed betterments to serve increased traffic. Sufficient resurfacing contracts have been let to replace worn-out road surfaces. Oiling methods have been improved, and the mileage of oiled roads rapidly expanded. Free ferry service has been provided at two major waterways on the Roosevelt Highway. Additions have been made to the state park property. Several inadequate old bridges have been replaced by new standard structures. Routine patrol maintenance has been kept up to a consistent standard while interruptions to traffic caused by storms, slides, etc., have been held to a minimum. The necessity for meeting increased payments due on bond principal, together with larger amounts needed each year for maintenance purposes as new mileage is added and traffic increased, has tended to reduce the state funds available for new construction.

The sum total of improvements on the state highway system during the biennium are 0.8 miles of paving, 107.6 miles of bituminous macadam, 631.6 miles of oiled macadam, 286.5 miles of rock surfacing, 154.7 miles of resurfacing, 213.0 miles of grading, 54.6 miles of grade widening, and 48 bridges over 20 feet in length. A large part of this work has been done by the state highway department but the counties have helped by construction with their own forces. The work performed by the Bureau of Public Roads on forest highways and within the Crater National Park has also added materially to the improvement. The mileage completed by each agency can best be shown in tabulated form, as follows:

By Whom Constructed	Oiled and Bituminous Macadam	Rock Surfacing	Grading	Grade Widening
State	727.2	209.8	147.7	32.9
Counties	-------	5.6	23.4	-------
Government (Forest Highways)	-------	71.1	41.9	21.7
Government (Crater Lake Park)	12.0	-------	-------	-------
Total Mileage	739.2	286.5	213.0	54.6

Adding the mileage of new construction accomplished during 1927 and 1928 to the mileages previously completed and to the mileages of completed work upon state highway routes within incorporated cities and towns and within Multnomah County, gives the following as the status of state highway improvement as of November 30, 1928: 895.4 miles paved; 112.0 miles surfaced with bituminous macadam; 1,098.8 miles surfaced with oiled macadam; 1,383.7 miles surfaced with broken stone and crushed gravel; 233.8 miles graded and ready for surfacing; and 644.6 miles unimproved; the term unimproved, as here used, meaning not yet graded to state highway standards of width, grade and alignment. Expressed on a percentage basis, the 4,368.3 miles of highways in the state highway system are now 20.5 per cent paved; 2.6 per cent surfaced with bituminous macadam; 25.1 per cent surfaced with oiled macadam; 31.7 per cent surfaced with rock or gravel surfacing; 5.3 per cent graded and ready for surfacing, and 14.8 per cent unimproved.

In addition to the construction program and major betterments which are handled as contracts, a large number of smaller improvements or minor betterments are handled each year by the maintenance forces or small extra gangs which, in this aggregate, makes an effective total. These may be classified as widening embankments with slide materials, widening sharp curves, ditching and otherwise improving drainage conditions, guard fence, cutting dangerous, leaning trees, improving sight distance by clearing, etc.

Briefly stated, the outstanding features of the construction program of the biennium were the completion of sections of the Roosevelt Coast Highway between Mohler and Garibaldi in Tillamook County, between Siletz Bay and Newport in Lincoln County, and between Reedsport and Lakeside in Douglas and Coos Counties. Mention should also be made of the completion of the John Day Highway between Unity and Brogan, and the opening of the Redwood Highway between Grants Pass and the state line. In Benton County, the Alsea and Corvallis-Newport Highways have been finished, while in Eastern Oregon the Heppner-Pendleton project has been opened to all year traffic. A beginning has been made on the Mitchell-Dayville unit by the completion of a seven-mile grading unit. Completed bridges include the Willamette River structure at Springfield, the Rogue River Bridge at Gold Hill, the Luckiamute River Bridge near Monmouth, and the reinforced concrete arch structures at Rocky Creek and DePoe Bay on the coast.

For a complete record of the projects undertaken and of the mileages of work performed in connection with each, reference should be made to the detailed table included in Part Four.

WORK UNDER CONTRACT

Inclusive of uncompleted work under contracts let during the 1925-26 biennium, there were under contract during 1927 and 1928 a total of 0.8 miles of paving, 232.7 miles of crushed rock and gravel surfacing, 157.6 miles of grading, 180.9 miles of crushed rock and gravel resurfacing and 33.1 miles of grade widening. Of these mileages, there remained uncompleted on November 30, 1926, 22.9 miles of crushed rock and gravel surfacing, 9.9 miles of grading, 26.2 miles of crushed rock and gravel resurfacing and 0.2 miles of grade widening.

In addition to the work mentioned in the above paragraph, there were under contract a large number of projects involving the production and stock-piling of crushed rock and crushed gravel for use in connection with maintenance operations, oiling and bituminous macadam construction. Also, a large number of projects involving bridge construction.

The total estimated cost of the work under contract during the two-year period is approximately $8,060,000. For the part of this work which has been completed during the biennium, there has been expended approximately $6,990,000, leaving a total obligation under uncompleted contracts of approximately $1,070,000.

REVENUES AND EXPENDITURES

The expenditures made by the State Highway Commission during the years 1927 and 1928, have amounted to the sum of $20,531,687.18, of which sum the State has contributed $17,449,814.70; the Federal Government has contributed $1,693,961.84; the various counties of the State have contributed $1,302,305.17; and railroad companies and other co-operators have contributed $85,605.47.

The revenues from which the $17,449,814.70 contributed by the State were derived are as follows:

Source	1927	1928	Total
Motor vehicle license fees	$ 4,620,000.00	$ 4,926,609.20	$ 9,546,609.20
Gasoline and distillate tax	3,887,655.24	3,657,288.38	7,544,943.62
Motor transportation fees	49,854.21	98,302.35	148,156.56
Interest on bank balances, etc.	46,053.35	19,939.31	65,992.66
Fines for traffic law violations	23,716.20	19,256.85	42,973.05
Funds on hand at beginning of biennium	870,407.98		870,407.98
Totals	$ 9,497,686.98	$ 8,721,396.09	$18,219,083.07

It should be noted that the $20,531,687.18 mentioned above as the amount expended by the Highway Commission during 1927 and 1928, includes $6,599,276.86 expended in the payment of interest and maturities on bonds, the whole of which was, of course, paid from the $17,449,-814.70 of funds contributed by the State. Therefore, the amount of State funds contributed toward actual construction and maintenance operations during the two-year period was only $10,850,537.84.

The $1,693,961.84 contributed by the Federal Government is the amount of Federal Aid paid over to the State during the biennium in accordance with the terms of the Federal Aid Act. It does not include any of the money expended by the Federal Government in the construction and maintenance of forest roads. The amount is smaller this biennium than usual and is approximately $700,000 less than the amount of Federal Aid apportioned to the State during the same period. The reason for the shortage is that not sufficient state funds were available for expenditure on Federal Aid highways to make possible the matching of all of the federal funds offered. The unmatched federal funds will not be lost to the State, however, unless the State becomes more than two years in arrears in its matching of the government's apportionments, which condition can be avoided, it is believed, if the State's highway revenues are maintained at their present levels.

The $1,302,305.17 contributed by the various counties of the State is the amount of county cooperation paid in during the biennium in accordance with cooperative arrangements agreed upon between the Highway Commission and the officials of the respective counties. Like the Federal Aid, this county cooperation is considerably less than for previous bienniums, the reduction being due principally to the fact that on account of the limited amount of State funds available for new construction work during the biennium, there has been less of this class of work to attract cooperation from the counties. Also, much of the work done was in outlying districts where the counties were unable to assume any very large proportions of the costs.

The $85,605.47 contributed by railroad companies and other cooperators is the amount contributed by these cooperators toward the cost of grade crossing eliminations and other work from which they derive benefit.

For a comparison of the expenditures and revenues of 1927 and 1928 with the expenditures and revenues of previous years, reference should be made to the tables on pages 132 to 135 of this report. The relative proportions of expenditures under the several main heads of expenditure classifications are very clearly indicated in the charts which appear on pages 22 and 23, as are also the relative proportions of the various income items.

FUNDS AVAILABLE FOR EXPENDITURE DURING 1929 AND 1930

At the beginning of the year 1929, there is in the State Highway Fund (exclusive of market road money) a balance of $769,268.37. It is estimated that during the years 1929 and 1930, there will accrue to this fund $10,550,000 from the motor vehicle license fee revenues, $8,800,000 from the gasoline tax, $200,000 from motor transportation fees, and $80,000 from various other sources. Adding all of these amounts together gives a total of $20,399,268.37 as the amount of State money that will be available for expenditure by the State Highway Commission during the 1929-30 biennium.

Of this $20,399,268.37 of State money, $1,071,244.80 will be required to complete contracts in effect at the beginning of the fiscal year 1929, and $6,671,893.17 will be required to pay due interest and principal on outstanding bonds. Approximately $200,000 will be required to cooperate with the Federal Government in forest highway work. Approximately $8,000,000 will be required for maintenance work and for such minor additions and betterments as are made necessary by the normal increase in traffic. Approximately $700,000 will be required for rights-of-way, parks, rock quarries, gravel pits and additional equipment. Approximately $750,000 must be reserved for such items as administration, general supervision, traffic law enforcement, surveys, revolving fund, et cetera. Not less than $500,000 must be held for contingencies, over-runs of estimates and unforeseen expense of other kinds. Subtracting these amounts from the probable amount of available State money, as above stated, leaves approximately $2,500,000 of State money available for additional construction and betterment projects.

In connection with work under contract at the beginning of the biennium, it is estimated that the State will be able to collect approximately $450,000 of Federal Aid, and approximately $250,000 of county cooperation. These amounts, added to the $2,500,000 of State money mentioned above, bring the total amount more or less definitely available for new projects to $3,200,000, and this amount will be increased by whatever amounts of Federal Aid and county cooperation the Highway Commission may be able to obtain.

There will be available to the State a total of about $3,500,000 of Federal Aid funds, $1,135,000 of this being a balance carried over from 1928 and $2,365,000 being the probable apportionment for the years 1929 and 1930. However, with the limited amounts of State and county funds that will be available for the matching of these Federal funds, it is not likely that more than about $2,000,000 of the $3,500,000 can actually be taken up during the biennium.

Estimating from the experience of previous years, it appears reasonable to expect the counties to cooperate in new projects to the amount of about $800,000.

Adding together the $2,500,000 of State funds that are available for additional projects, the $450,000 of Federal Aid and the $250,000 of county cooperation that are definitely under agreement, and the $2,000,000 of Federal Aid and the $800,000 of county cooperation that may be obtained, gives $6,000,000 as the probable gross total amount that will be available during the biennium for additional new construction and betterment projects.

FEDERAL AID

With the regular revenues of the State required largely for the payment of interest and maturities on bonds and for the maintenance of constructed highways, and with only a limited balance available for new construction work and betterment work, the Highway Commission is experiencing difficulty in matching and taking up the Federal Aid, which is being offered to the State by the Federal Government on a 62-38 basis of cooperation.

The funds that the State has available for new construction work would be sufficient to match all of the Federal Aid offered were it possible to obtain Federal Aid on all new construction and betterment work; but Federal Aid is limited to those highways which are included in the Federal Aid system, and not all of the State highways are included in that system; in fact, much more than half of the mileage of State highways remaining to be constructed are not on that system and, therefore, are not eligible for Federal Aid. In fairness to those highways which are not eligible for Federal Aid, their share of new construction and betterment operations must be financed with State funds, and when that is done, the amount of State funds remaining is barely sufficient to match the State's full apportionment of Federal funds. This condition is made more difficult by the fact that Federal Aid is further limited to $18,669 per mile, and in connection with heavy work, such as is encountered on the Roosevelt Coast Highway and elsewhere in the State, that amount is far from being 62 per cent of the cost; so that the State, instead of having to provide only 38 per cent of the cost, must provide a much higher

proportion, and on sections of highway where the limit of Federal Aid has already been received, the State must bear the entire cost of whatever additional improvement is required. The limitations on Federal Aid, therefore, make it impossible to anticipate or to estimate in advance the extent to which Federal Aid may be relied on to assist in the financing of the State's construction and betterment program, or to estimate, except in a very general way, the amount of State funds that must be expended for new construction and betterment work during a given period in order to have sufficient eligible Federal Aid work included to take up the Federal Aid funds available.

During the biennium just closed, Oregon's share of the Federal Government's appropriations for Federal Aid was $2,371,909. With a total expenditure for new construction and betterment work of about $5,350,000, the State was able to collect only $1,693,961.84 (about 32 per cent) of Federal Aid. The State is, therefore, about $678,000 behind in taking up its Federal Aid apportionments. No actual loss of Federal Aid will occur, however, until the State is $2,375,000 (two full years' apportionments) in arrears, which point, it is believed, need never be reached if the present schedule of State highway revenues is maintained.

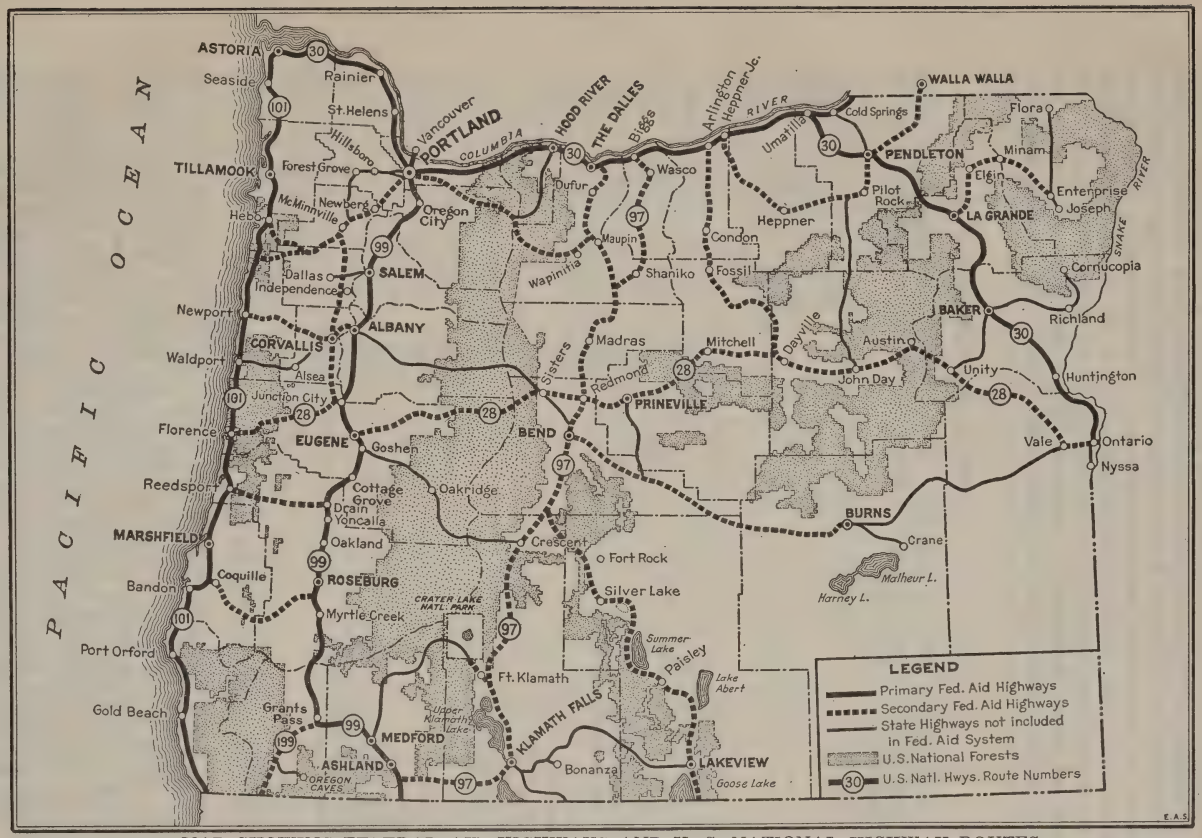
One development of the past biennium that has been of material benefit to Oregon in connection with its Federal Aid work, was the passage by Congress of an act whereby the State's allowable mileage of Federal Aid has been increased by the number of miles of Federal Aid highways within national forests, national parks, Indian reservations, and other government reservations. This action has made it possible for the State to place several more highways in the Federal Aid system, thereby making those highways eligible for Federal Aid. The highways added are as follows:

1. Corvallis-Newport Highway,
2. Siuslaw Highway (Junction City to Florence),
3. Mt. Hood-Wapinitia Highway (Portland to Maupin),
4. Central Oregon Highway (Bend to Burns),
5. Salmon River Highway (Grande Ronde to Otis).

Other adjustments of Federal Aid mileages have made it possible to add to the Federal Aid system during the biennium the following other highways:

1. Fremont Highway (Silver Lake to Lapine),
2. Umpqua Highway (Drain to Reedsport).

At the present time, Oregon's allowable mileage of Federal Aid highways is 3,287.90 miles, which mileage is seven per cent of the 41,825.70 miles of public highways in Oregon as of November 9, 1921, plus the 360.10 miles of Federal Aid highways within the limits of national forests, national parks, Indian reservations and other government reservations, as of the present date. Of this allowable mileage, not to exceed three-sevenths (1,409.10 miles) may be primary Federal Aid highways. The balance of the mileage is classed as secondary Federal Aid highways. The mileage of Oregon highways now included in the Federal Aid system is 3,227.01, of which 1,235.84 miles are of the primary classification and 1,991.17 miles are of the secondary classification. A complete list of the State's Federal Aid highways, with their respective mileages, is given in an accompanying tabulation. Federal Aid highways do not include any mileages within cities or towns having populations greater than 2,500.



MAP SHOWING FEDERAL AID HIGHWAYS AND U. S. NATIONAL HIGHWAY ROUTES

Federal aid can be obtained only in connection with work upon those highways which are shown on this map in heavy solid lines or in heavy dotted lines. Those highways which are shown in the lighter solid lines are not eligible for federal aid.

Those highways in the map which bear numbers enclosed in circles are on U. S. National Highway Routes, the numbers shown being the numbers of the respective routes. The U. S. National Highway Routes and the Federal Aid Highways have no definite relation one to the other although they coincide in many places.

Since the beginning of the extension of Federal Aid by the Government, a total of $13,251,256 has been apportioned to the State of Oregon; of this amount $11,661,036.16 has actually been paid over to the State, and $454,685.33 has been definitely assigned to particular projects and covered by executed project agreements. The remaining $1,135,534.51 has not yet been placed under agreement, due to the lack of available State funds with which to match it. This unmatched amount will be increased about $1,185,000 by next year's apportionment of Federal Aid, which apportionment will be made shortly after the first of the year.

MILEAGES OF FEDERAL AID HIGHWAYS

The mileages given in this table do not include mileages within cities and towns having populations of more than 2,500, as such mileages are not eligible for Federal Aid.

Highway	Total Federal Aid Mileage		Federal Aid Mileage Within National Forests	Federal Aid Mileage Within Indian Res. ervations	Federal Aid Mileage Within Other Federal Reserves
	Primary	Secondary			
Pacific	323.99	.....	7.53	.....	.....
Columbia River	312.33	.....	27.76	.....	*2.37
West Side Pacific	.....	104.18	.....	.....	.....
The Dalles-California	.....	281.50	20.12	43.50	.....
John Day (To Ontario)	.....	297.78	18.91	.....	.....
Old Oregon Trail	183.75	.....	.....	22.90	.....
Oregon–Washington	.....	143.61	.....	.....	.....
Roosevelt Coast	395.97	.....	51.46	.....	†0.97
La Grande-Wallowa Lake	.....	66.38	.....	.....	.....
McKenzie	.....	113.13	44.98	.....	.....
Fremont	.....	160.69	17.00	.....	.....
Ashland-Klamath Falls	.....	56.15	1.50	.....	.....
Crater Lake	.....	10.20	3.44	1.00	.....
Redwood	.....	42.90	.59	.....	.....
Albany-Corvallis	.....	9.92	.....	.....	.....
McMinnville-Tillamook	.....	48.68	14.54	.....	.....
Coos Bay-Roseburg	.....	62.02	.....	.....	.....
Umatilla Cut-off	19.80	.....	.....	.....	.....
Ochoco	.....	104.72	14.71	.....	.....
Sherman	.....	69.03	.....	.....	.....
Umpqua	.....	48.85	11.10	.....	.....
Siuslaw	.....	67.03	17.60	.....	.....
Central Oregon	.....	131.50	.....	.....	.....
Mt. Hood-Wapinitia	.....	94.05	38.12	.....	.....
Corvallis-Newport	.....	56.65	.....	.....	.....
Salmon River	.....	22.20	.....	.....	.....
Totals	1,235.84	1,991.17	289.36	67.40	3.34

* Celilo Canal Reserve.
† Heceta Head and Cape Perpetua Light House Reserves.

All Federal Aid work is handled under the direct supervision of the State Highway Commission. It must be performed, however, in accordance with requirements laid down by the Federal Bureau of Public Roads, and all plans must be accepted and approved by that Bureau.

Federal cooperation has been working out very well in the State of Oregon, and every effort should be made to insure the continuance of the Federal Aid policy. The administration of the Federal Aid work by the Bureau of Public Roads is being very efficiently handled, and the officials of that Bureau, particularly those in charge of the work in the northwest states, have in every way endeavored to cooperate with the Highway Commission, and to apply Federal Aid in the State of Oregon in the most practical way.

FOREST HIGHWAYS

Since 1916, Federal appropriations have been made for forest roads. At first limited to roads within the national forests, the act was later broadened to include roads adjacent to the national forests. The total annual appropriation for all the states for several years has been $7,500,000. Oregon's share, because of the extent of the national forests in the State, is approximately $1,075,000 annually. These funds are divided in two parts under the law, one for forest highways, the other for roads and trails. By way of comparison, in 1928 the first amounted to $622,165; the second, to approximately $453,000.

The annual forest highway program is agreed upon by a joint conference of representatives of the Bureau of Public Roads and the Forest Service with the State Highway Commission, and is submitted to the Secretary of Agriculture for approval. The allotment of the roads and trails part of the appropriations is made by the Forest Service without reference to the Bureau of Public Roads or the State. All forest highway engineering and construction is handled by the Bureau of Public Roads. Also, all contracts are made by the Government. County and State cooperative funds are paid to the Government as required during the progress of the work.

The total forest highway funds allotted to Oregon since 1916 total $6,899,817.89. Of this amount $4,531,665.47 has been expended on the State highway system, to which has been added $3,637,598.85 of State funds and $1,287,470.90 of county funds or a total of $9,456,735.22 expended for forest highways upon the State highway system. Expressed in mileages, 502.96 miles have been graded, 21.7 miles of grade have been widened, 442.29 miles have been surfaced and 648.8 miles have been surveyed.

Forest highway funds are expended on county roads as well as State highways. Examples of this may be found on the Reedsport-Scottsburg and Tiller Trail projects in Douglas County, the Heppner-Spray project in Morrow and Wheeler Counties, the Canyon City-Burns project in Grant and Harney Counties and the Salmon River Road in Lincoln County. This assistance has been of great help to the counties.

All forest highways are maintained for two years after completion by the Government, after which the State, in the case of State highways, and the county, in the case of county highways, must assume the obligation of maintenance.

The more important forest highway projects of the biennium on the State highway system are the Wapinitia project in Wasco County, the Fremont Forest Section of the Fremont Highway in Klamath County, and Yaquina Bay-Seal Rocks Section of the Roosevelt Highway in Lincoln County. Also work has been done on the Pendleton-John Day Highway in Grant County. Widening has been undertaken on both the Mt. Hood Loop and the Oregon Caves Highway, while in Southern Oregon the surfacing on the Fremont Forest Section has completed that unit of the Klamath Falls-Lakeview Highway. Mention should also be made of two units of the Santiam and a unit on the Willamette Highway above Lowell. The 1927 forest highway program on State highways totaled $579,013.56, of which $325,542.44 was Government funds; and for 1928, the figures are: Total expenditures $414,874.56, of which $257,246.68 was Government funds.

For a complete list of the forest road projects placed under contract, with estimated costs, cooperative shares, amounts expended and other detailed information, see compilation of forest road projects included in Part Three of this report.

FEDERAL AID FUNDS AND FEDERAL FOREST ROAD FUNDS APPORTIONED TO OREGON

The following table shows the funds that have been apportioned to Oregon under the various Federal Aid Acts:

Period for Which Funds Are Appropriated	Federal Aid Funds	Forest Road Funds	Total
Act of July 11, 1916			
July 11, 1916, to June 30, 1917	$ 78,687.37	$ 127,794.00	$ 206,481.37
July 1, 1917, to June 30, 1918	157,374.74	128,111.00	285,485.74
July 1, 1918, to June 30, 1919	236,332.74	132,796.00	369,128.74
July 1, 1919, to June 30, 1920	314,983.64	131,966.00	446,949.64
July 1, 1920, to June 30, 1921	394,038.01	130,071.00	524,109.01
July 1, 1921, to June 30, 1922	.....	128,661.00	128,661.00
July 1, 1922, to June 30, 1923	.....	122,967.00	122,967.00
July 1, 1923, to June 30, 1924	.....	136,587.00	136,587.00
July 1, 1924, to June 30, 1925	.....	136,686.00	136,686.00
July 1, 1925, to June 30, 1926	.....	136,810.00	136,810.00
Act of February 28, 1919			
February 28, 1919, to June 30, 1919	787,459.10	218,871.00	1,006,330.10
July 1, 1919, to June 30, 1920	1,181,188.64	218,871.00	1,400,059.64
July 1, 1920, to June 30, 1921	1,182,114.02	158,939.00	1,341,053.02
Act of November 9, 1921			
November 9, 1921, to June 30, 1922	1,182,663.90	310,749.00	1,493,412.90
July 1, 1922, to June 30, 1923	.....	846,360.00	846,360.00
Act of June 19, 1922			
July 1, 1922, to June 30, 1923	788,442.60	.....	788,442.60
July 1, 1923, to June 30, 1924	1,026,044.09	453,395.00	1,479,439.09
July 1, 1924, to June 30, 1925	1,176,830.15	453,093.00	1,629,923.15
Reapportionment of Funds			
July 1, 1925, to June 30, 1926	10,575.00	.....	10,575.00
Distribution of "Special Funds"	.....	561,694.89	561,694.89
Act of February 12, 1925			
July 1, 1925, to June 30, 1926	1,179,668.00	581,745.00	1,761,413.00
July 1, 1926, to June 30, 1927	1,182,945.00	581,138.00	1,764,083.00
July 1, 1927, to June 30, 1928	1,182,202.00	580,348.00	1,762,550.00
July 1, 1928, to June 30, 1929	1,189,707.00	622,165.00	1,811,872.00
Total funds authorized	$13,251,256.00	$ 6,899,817.89	$20,151,073.89
Total funds allocated	$13,251,256.00	$ 6,899,817.89	$20,151,073.89
Expended for construction on state highways	$11,661,036.16	$ 4,531,665.47	$16,192,701.63
Obligated for construction on state highways	$ 454,685.33	$ 282,253.79	$ 736,939.12
Expended and obligated for maintenance and for construction not on state highways	.....	2,024,025.49	2,024,025.49
Total expended and obligated	$12,115,721.49	$ 6,837,944.75	$18,953,666.24
Unobligated balances	$ 1,135,534.51	$ 61,873.14	$ 1,197,407.65

COUNTY COOPERATION IN WORK ON STATE HIGHWAYS

Under cooperative agreements in effect at the beginning of the 1927-1928 biennium, and under cooperative agreements entered into during that biennium, a total of $1,961,508.95 of county money has been obligated for expenditure in cooperation with the State on construction work on State highways. Of this amount, $1,302,305.17 was disbursed during the two-year period, of which $767,214.37 was paid out by counties under county vouchers drawn by the State Highway Department, and $535,090.80 was paid into the State Highway Fund by counties for direct disbursement by the State. Subtracting the amount of the disbursements from the amount of the obligations, leaves $659,203.78 as the outstanding county obligation in connection with State highway work, as of November 30, 1928. The details of the amounts obligated and the amounts expended by each county, showing the particular pieces of work involved, will be found in Part Three of this report.

In addition to the amounts mentioned above, counties have obligated themselves to the extent of $187,655.15 in connection with forest road work on State highways, which work is handled under the supervision of the United States Bureau of Public Roads and the United States Forest Service. County expenditures during 1927 and 1928, on this forest road work on State highways, have amounted to $160,155.15, leaving an obligated balance payable by counties of $27,500.

MARKET ROADS

The legislature of 1919 passed, and the people by a referendum vote approved, the State Market Road Act, which created the State Market Road Appropriation, to provide State Aid for the construction of certain county roads designated as market roads. The Appropriation is raised by a State one-mill levy on all the taxable property in the State, to be apportioned to the counties by ratio of assessed valuation, provided that no county may receive in excess of 10 per cent of the total amount raised in any one year. County market road levies are made to raise funds to match the State Market Road Appropriation funds. The State Highway Commission administers the Act, the cost of administration being deducted from the Market Road Appropriation before apportioned to the counties. The turnover of funds is made twice a year, shortly after each half of the State taxes are collected. During the nine years the Market Road Act has been in operation, the State Highway Commission has administered the State Market Road Appropriation as follows:

Raised by State one-mill levy		$9,482,500.67
Apportioned and paid to counties	$9,395,581.32	
General administration and supervision	78,032.39	
Cash on hand November 15, 1928	8,886.96	
	$9,482,500.67	$9,482,500.67

Due to that part of the Act which provides that no county may receive in excess of 10 per cent of the total amount raised in any one year, there has been each year an amount raised by the State one-mill levy in Multnomah County, in excess of the amount apportioned and turned over to Multnomah County from the State Market Road Appropriation. During the nine-year period, there has been collected by the State one-mill levy in Multnomah County $3,330,940.70, while the total apportioned and paid to

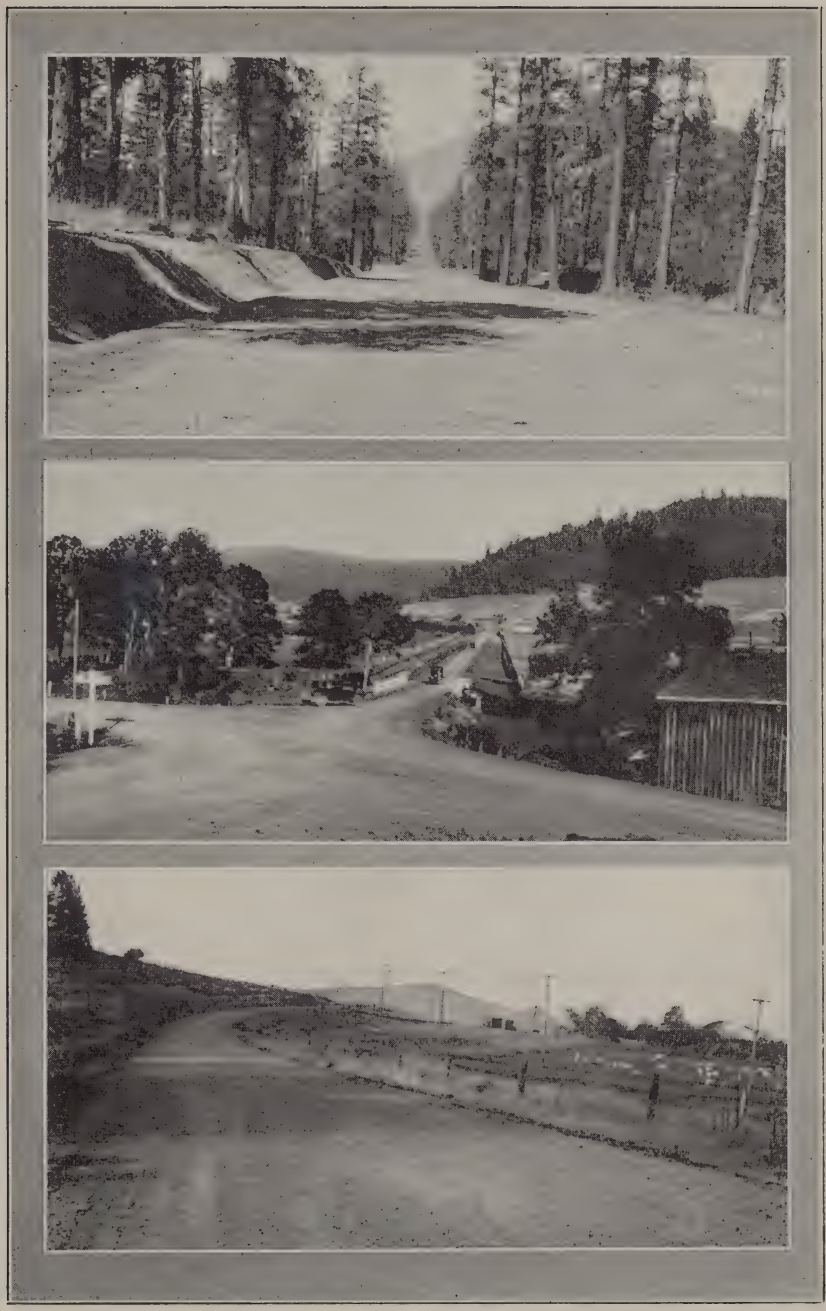
Multnomah County from the State Market Road Appropriation was $944,177.92. The difference of $2,386,762.78 constitutes the so-called Multnomah County surplus which has been apportioned and turned over to the other counties as a part of the Appropriation. Each other county has benefited from this surplus by having each year been apportioned an amount in excess of the amount collected by the State one-mill levy in that county, the amount of the excess in each case having been in proportion to the equalized assessed valuation.

In certain cases the county levy was not sufficiently large to match the entire amount apportioned. In those cases the unmatched funds remained in the appropriation and were included in the amount to be apportioned the following year. In 1928 two counties inadvertently failed to levy sufficient to match all of the funds apportioned to them. Transfer of county emergency funds to the County Market Road Fund was made in amounts to increase the total levied to the amount apportioned. Acting under legal advice based on a provision of the local budget law, the Commission turned over to these counties the total amounts apportioned to them.

As an accommodation to the counties, the Highway Commission has, whenever requested by the county officials, furnished from its stocks, at cost, such supplies and equipment as the counties could not readily obtain elsewhere. Likewise, the Highway Commission has furnished, at cost, such engineering services as the counties have desired to have furnished. The cost of these supplies and services are looked upon as advances of funds that are later to become due the counties under their respective apportionments from the State Market Road Appropriation, and deductions to cover the costs are made from the county apportionments at the time the balance of the apportionments are turned over to the counties in cash. During the last biennium, the Highway Commission has each month prepared statements showing the amounts of such charges accruing during the month and has forwarded the statements to the counties. This was done at the request of several counties so they could check the correctness of the charges, keep more closely informed of engineering costs and simplify county bookkeeping. Most of the counties have paid the charges by warrant monthly, but some have requested that the advances continue to be deducted from their apportionments. The following statement does not show the full extent to which the counties have taken advantage of this service, as many supplies have been furnished and much engineering work has been performed for which the counties reimbursed the Commission in cash:

Total of advances made to counties and deducted	$ 213,075.23
Paid to counties in cash	9,182,506.09
Total amount apportioned to counties 1920-1928	$9,395,581.32

The original act provided that plans for market road work be prepared and submitted to the State Highway Commission for approval and that, upon approval, the funds be turned over to the counties. The division of authority was not definite, and it was found that after plans had been approved and the funds turned over, the authority of the Commission ended, so that supervision which would assure many economies was impossible. In 1925 the legislature, by amending the Market Road Act, outlined more definitely the division of authority, created the office of county engineer, provided for county market road systems, for cost keep-



MARKET ROADS. TOP—IN DESCHUTES COUNTY; CENTER—IN LANE COUNTY; BOTTOM—IN KLAMATH COUNTY

ing, for maintenance, and for the expenditures of market road funds upon some State highways, and increased, in a measure, the responsibility of the State Highway Commission.

Under the revised act, the county court designates the county market road system and appoints the county engineer. The county engineer makes the surveys and prepares the plans and specifications for the projects which the county court elects to improve. The plans are submitted to the State Highway Commission, and upon approval, contracts are let or the work is done by county forces.

The county engineer supervises construction and is charged with keeping accurate cost records of all of the projects, and for this purpose all market road bills are required to go through his hands. He must also certify that the work for which payment is being made has been done in accordance with the approved plans and specifications, and is placed under bond to protect the county against any loss.

The Highway Commission administers the act, apportions and turns over the funds to the counties, supervises construction and maintenance, and inspects surveys, plans, specifications and contracts. Due to the great amount of work being done, the large number of surveys, projects, contracts, etc., the supervision which the Commission is able to give is limited, and much of the responsibility for the detail work is left to the county engineers. The cost of State highway supervision during the last biennium has been slightly less than one-half of one per cent of the total funds expended.

Considerable amounts of county funds other than those raised by market road levies are used to cooperate on market road construction and maintenance. These funds are required by law to be expended as market road funds and subject to the same requirements, no matter from what source they come. The largest contributor to this class of funds was county road bond issues. Other sources are road district special levies, county general road funds, county motor vehicle funds, O. & C. funds, forest service funds, railroad cooperation, donations, etc. Not all of the cooperative funds expended on market road construction during the first five-year period were reported. Under the revised act, however, more complete reports are available, which indicate cooperative expenditures as follows:

1925	$ 858,679.15
1926	1,517,346.55
1927	1,302,582.57
1928	1,161,632.98

Since the designation of the original systems and the approval of the county market road designation maps, several counties have found it desirable to make additions and extensions to their market road systems, and in a few cases, counties have reduced the mileages in their systems. The county court in each such case designated the addition, the extension or the elimination to be made, and, upon the approval of the State Highway Commission, the change became effective. The total mileage of roads in the combined market road system (Multnomah County roads and state highways excluded), and the state of improvement, as of November 1, 1928, is as follows:

Miles of bituminous paved roads	249.02
Miles of concrete paved roads	118.70
Miles of rock or gravel surface roads	2,570.48
Miles of improved earth roads	513.85
Miles of unimproved roads	1,827.00
Total mileage of market roads	5,279.05

Since the beginning in 1920, there has been made available for market road construction and improvement $24,766,898.15. Of this sum $9,395,-581.32 was apportioned to the counties from the State Market Road Appropriation; $9,851,557.33 was raised by county market road levies and $5,519,759.50 was funds from other sources, expended in cooperation with market road funds on market roads.

During the same period a total of $24,391,822.89 has been expended, and included in this amount are expenditures as follows:

$1,084,342.00 as cooperation on State highway projects
479,235.00 for major bridges
318,430.00 as cooperation on forest and other road projects
709,288.42 for market road maintenance.

The balance was expended on market road construction projects, the following work having been accomplished: grading, 2,477.06 miles; rock or gravel surfacing, 1,989.97 miles; paving, 248.92 miles.

The above figures for funds available, funds expended and work accomplished are for the nine-year period, and indicate the extent and importance of the market road improvements. One, two or three years work did not make much showing, but the nine-year period shows the cumulative effect of year after year of additional improvement.

During the last two years, a total of $6,680,663.42 was expended as follows:

$ 231,312.00 as cooperation on State highway projects
257,208.00 for construction of major bridges
43,530.00 as cooperation on forest road projects
495,604.43 for market road maintenance
445,805.15 expended by Multnomah County and no mileage counted
5,207,203.84 for market road construction projects

The last mentioned of these expenditures resulted in improvement work as follows: Grading 664.48 miles, rock or gravel surface 582.48 miles, and paving 27.48 miles. Arbitrarily dividing the cost by the number of miles improved, gives rough average costs per mile of $5,600 for grading, $2,500 for rock or gravel surfacing, and $10,000 for paving. These figures are arbitrarily taken as average for all miles of work accomplished during the two-year period in all counties (Multnomah County excepted), as an indication, only, of the average costs of the market road improvements. The costs are very low considering the amount of heavy grading work that has been done, and the fact that considerable right-of-way cost is included in the grading cost.

The extent of improved mileage after nine consecutive years of work is making possible the establishment of maintenance organizations, with patrol units and proper equipment, which provide efficient and economical maintenance and which assure the tax-paying public not only that the improved mileage shall be actually available for all-weather and all-year travel, but also that the investment in the roads themselves will not be lost by allowing grade and surface to deteriorate and be lost. The need and value of maintenance are becoming more generally realized, and all but a few of the counties have established maintenance organizations with the patrol gang system and good equipment. Those counties which have a considerable mileage to maintain find this an economical plan; many counties maintain county and market roads with the same equipment, thus accomplishing both more economically as the equipment can be worked to capacity. The smaller counties have a more difficult problem, as the mileage to maintain is smaller and generally the sections are more widely

separated, so that even combining maintenance of county and market roads does not provide sufficient mileage to occupy a gang or patrol full time and consequently these counties must resort to part-time work and to cheaper equipment.

During the first five-year period maintenance with market road funds was not authorized. Market roads were maintained as county roads. The amended act authorized market road maintenance, but few counties were able to organize for systematic maintenance in 1925. In 1926, however, 1,987 miles were maintained at an average cost of $88 per mile, in 1927, 2,368 miles at an average cost of $105 per mile, and to November 1, 1928, 2,781 miles at an average cost of $89 per mile. The 1928 cost is for an incomplete year and the complete year's cost will probably be about the same as for 1927.

There is a consistent difference in cost of market road maintenance in eastern and western Oregon caused by differences in soil formations, amounts of rainfall and amounts of traffic.

	EASTERN OREGON	WESTERN OREGON
1926	810.57 miles at $62 per mile	1,176.66 miles at $109 per mile
1927	892.17 miles at 72 per mile	1,476.16 miles at 125 per mile
1928	1,037.03 miles at 51 per mile	1,744 miles at 110 per mile

Some of the counties have been handicapped to some extent in their market road operations by the fact that the improvement of their State highways, which are more vital to them than their secondary roads, has not been entirely completed. The improvement of feeder roads should follow, rather than precede, the improvement of the State highways. The provision of the Market Road Act, which permits these counties to concentrate their efforts upon their State routes, has proven most wise. Several counties have materially advanced the improvement of their state highway during the last biennium by the use of market road funds.

The end of the 1928 construction season completes four years of operation under the amended Market Road Act. There has been continued improvement in results and economy, the counties are becoming better organized, the improved mileage is being properly maintained, cost records are being kept and the economic value of various methods, equipment, and operations, is being closely investigated.

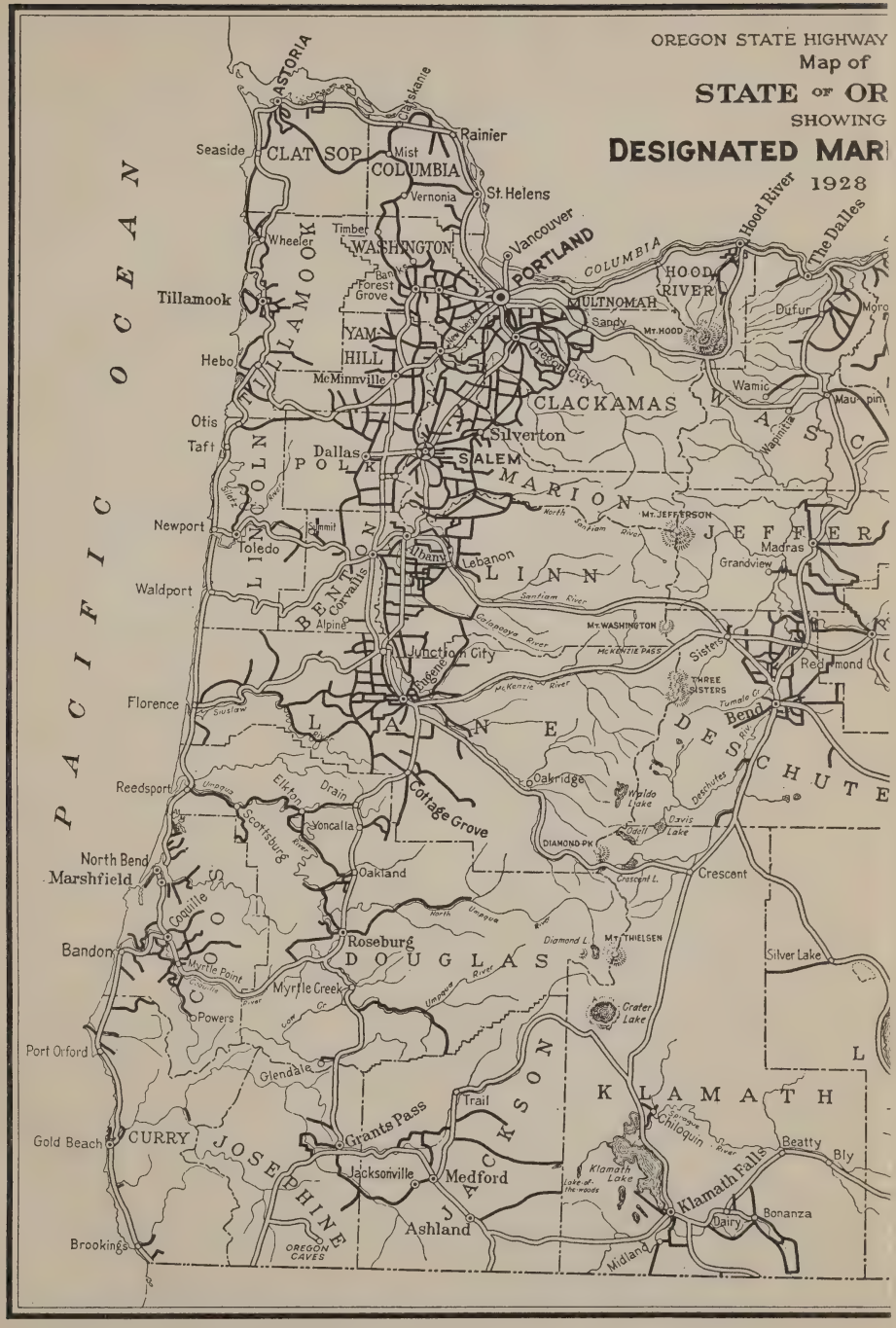
The market road improvement has been even and steady, almost the same income having been available each year. Having a yearly construction and maintenance fund assured has enabled each county to secure proper equipment for both maintenance and construction, and to establish organizations for engineering, construction and maintenance. By offering full-time employment, efficient men are attracted and retained, each year's experience adding to their knowledge, ability and skill. A general stabilizing influence is exerted by the Market Road Act, which is noticeable in its effect upon the county highway finances, upon the county highway engineering, construction and maintenance organizations, upon the highway improvement programs, and upon the class of work performed. The system of roads is definitely designated. Most of the work is confined to the more important roads. Incoming officials recognize the importance of the market road system and go ahead improving the designated roads, on about the same standards and, usually, with no changes in the personnel of the organizations.

FINANCIAL STATEMENT STATE MARKET ROAD APPROPRIATION—1920-1928

	1920	1921	1922	1923	1924
Amount carried over from previous year	$	$	$ 15,669.56	$ 6,920.50	$ 4,185.58
Amount raised by one-mill general State levy	990,435.47	1,040,839.05	1,020,804.20	1,009,499.16	1,042,410.62
Total amount available for distribution	990,435.47	1,040,839.05	1,036,473.76	1,016,419.66	1,046,596.20
Total amount apportioned and matched	990,435.47	1,020,562.61	1,024,557.94	1,006,266.38	1,036,208.78
Advances to counties in service and supplies	28,635.77	26,223.61	38,311.15	24,495.29	28,296.00
Paid to counties in cash	961,799.70	994,339.00	986,246.79	981,771.09	1,007,912.78
Expended for general administration	*	4,606.88	4,995.32	5,967.70	6,352.16
Amount carried over unapportioned and unmatched	.....	15,669.56	6,920.50	4,185.58	4,035.26

	1925	1926	1927	1928	Total
Amount carried over from previous year	$ 4,035.26	$ 1,943.38	$ 9,783.57	$ 10,528.12	$ .....
Amount raised by one-mill general State levy	1,058,880.74	1,084,537.62	1,110,677.35	1,124,416.46	9,482,500.67
Total amount available for distribution	1,062,916.00	1,086,481.00	1,120,460.92	1,134,944.58	.....
Total amount apportioned and matched	1,050,974.89	1,061,892.75	1,094,737.92	1,109,944.58	9,395,581.32
Advances to counties in service and supplies	21,696.64	25,874.84	7,867.23	11,674.70	213,075.23
Paid to counties in cash	1,029,278.25	1,036,617.91	1,086,870.69	1,098,269.88	9,182,506.09
Expended for general administration	9,997.73	14,804.68	15,194.88	16,113.04	78,032.39
Amount carried over unapportioned and unmatched	1,943.38	9,783.57	10,528.12	8,886.96	.....

*** General Administration Costs paid with State Highway Funds.**

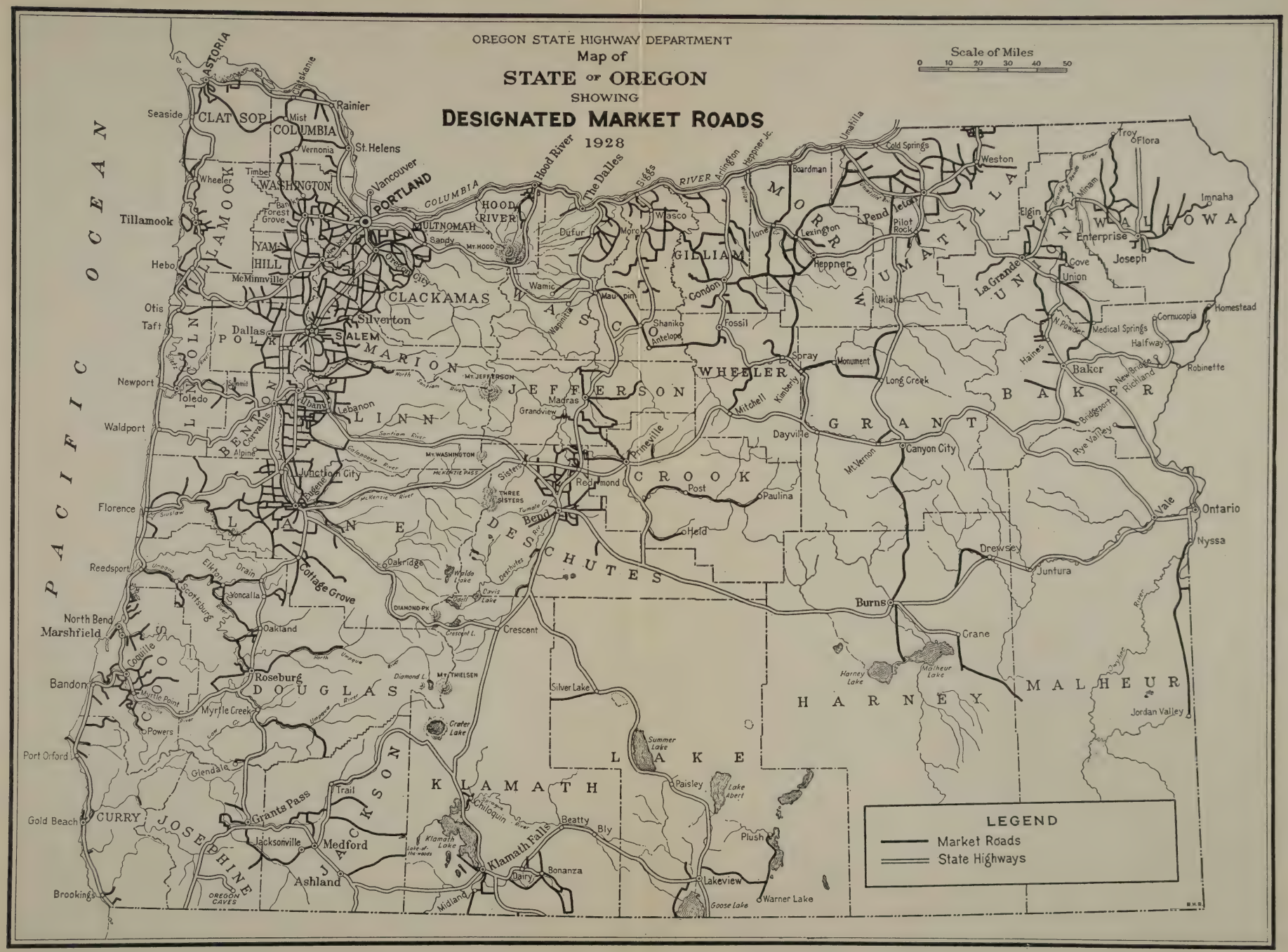

OREGON STATE HIGHWAY
Map of
STATE OF OR
SHOWING
DESIGNATED MAR
1928
PACIFIC OCEAN
ASTORIA
Columbia
Clatsop
Clatsop
Columbia
Rainier
Seaside
CLATSOP
Mist
COLUMBIA
St. Helens
Vernonia
Timber
Wheeler
WASHINGTON
Vancouver
PORTLAND
COLUMBIA
Hood River
The Dalles
Tillamook
Bay
Forest Grove
HOOD RIVER
MULTNOMAH
Sandy
Mt. HOOD
Dufur
Hebo
YAM-HILL
McMinnville
Willamette
Oregon City
Wamic
Maupin
Otis
Taft
Silverton
CLACKAMAS
Dallas
POLK
SALEM
MARION
Wapinitia
Newport
Toledo
Summit
Albany
Lebanon
Mt. JEFFERSON
North Santiam River
JEFFER
Madras
Grandview
Waldport
Corvallis
Alpine
LINN
Santiam River
Mt. WASHINGTON
McKENZIE PASS
Sisters
Redmond
Junction City
Eugene
McKenzie River
THREE SISTERS
Florence
Siuslaw
LANE
Tumalo Cr.
Bend
DESCHUTE
Reedsport
Umpqua
Elkton
Drain
Cottage Grove
Oakridge
Waldo Lake
Deschutes
Scottsburg
Yoncalla
Davis Lake
DIAMOND PK
North Bend
Marshfield
Coquille
Oakland
Crescent L.
Crescent
North Umpqua
Diamond L.
Mt. THIELSEN
Bandon
Roseburg
DOUGLAS
Silver Lake
Myrtle Point
Coquille
Myrtle Creek
Umpqua
Powers
Crater Lake
Port Orford
Glendale
Trail
KLAMATH
Chiloquin
Gold Beach
CURRY
JOSEPHINE
Grants Pass
JACKSON
Beatty
Bly
Jacksonville
Medford
Klamath Lake
Lake of the woods
Klamath Falls
Bonanza
Dairy
Ashland
Brookings
OREGON CAVES
Midland

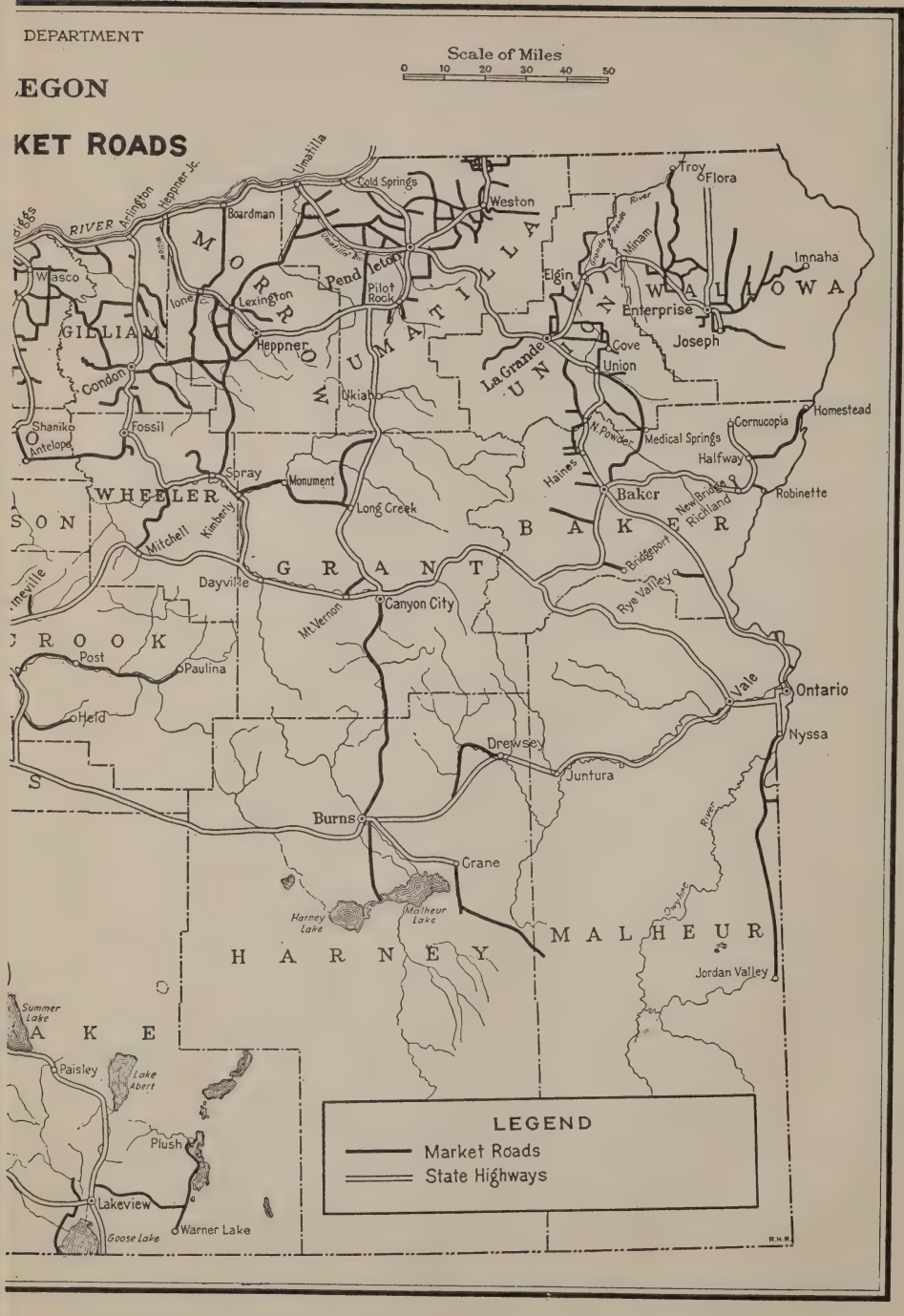
FINANCIAL STATEMENT STATE MARKET ROAD APPROPRIATION—1920-1928

	1920	1921	1922	1923	1924
Amount carried over from previous year	$	$	$ 15,669.56	$ 6,920.50	$ 4,185.58
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Total amount apportioned and matched	990,435.47	1,020,562.61	1,024,557.94	1,006,266.38	1,036,208.78
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Paid to counties in cash	961,799.70	994,339.00	986,246.79	981,771.09	1,007,912.78
Expended for general administration	*	4,606.88	4,995.32	5,967.70	6,352.16
Amount carried over unapportioned and unmatched	.....	15,669.56	6,920.50	4,185.58	4,035.26

	1925	1926	1927	1928	Total
Amount carried over from previous year	$ 4,035.26	$ 1,943.38	$ 9,783.57	$ 10,528.12	$ .....
Amount raised by one-mill general State levy	1,058,880.74	1,084,537.62	1,110,677.35	1,124,416.46	9,482,500.67
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Total amount apportioned and matched	1,050,974.89	1,061,892.75	1,094,737.92	1,109,944.58	9,395,581.32
Advances to counties in service and supplies	21,696.64	25,874.84	7,867.23	11,674.70	213,075.23
Paid to counties in cash	1,029,278.25	1,036,617.91	1,086,870.69	1,098,269.88	9,182,506.09
Expended for general administration	9,997.73	14,804.68	15,194.88	16,113.04	78,032.39
Amount carried over unapportioned and unmatched	1,943.38	9,783.57	10,528.12	8,886.96	.....

*** General Administration Costs paid with State Highway Funds.**


OREGON STATE HIGHWAY DEPARTMENT
Map of
STATE OF OREGON
SHOWING
DESIGNATED MARKET ROADS
1928
Scale of Miles
0 10 20 30 40 50
PACIFIC OCEAN
ASTORIA
Seaside
CLATSOP
Rainier
Mist
COLUMBIA
Vernonia
St. Helens
Vancouver
PORTLAND
Wheeler
Timber
WASHINGTON
Tillamook
Forest Grove
TILLAMOOK
YAMHILL
Hebo
McMinnville
Otis
Taft
Dallas
POLK
Silverton
SALEM
MARION
CLACKAMAS
MULTNOMAH
Sandy
MT. HOOD
Oregon City
Newport
Toledo
Waldport
LINCOLN
Albany
Lebanon
LINN
Corvallis
BENTON
Alpine
Junction City
Florence
Eugene
Reedsport
Drain
Elkton
Yoncalla
Cottage Grove
Oakridge
North Bend
Marshfield
Coquille
Oakland
Roseburg
DOUGLAS
Bandon
Myrtle Point
Myrtle Creek
Powers
Port Orford
Glendale
Grants Pass
CURRY
Gold Beach
JOSEPHINE
Jacksonville
Medford
Ashland
Brookings
OREGON CAVES
Trail
JACKSON
Hood River
The Dalles
COLUMBIA
RIVER
Sisters
Redmond
Bend
Prineville
Madras
Grandview
JEFFERSON
MT. JEFFERSON
MT. WASHINGTON
McKENZIE PASS
THREE SISTERS
DESCHUTES
Waldo Lake
Davis Lake
DIAMOND PK.
Crescent
Crescent L.
MT. THIELSEN
Diamond L.
Crater Lake
Wamic
Maupin
Dufur
Mosier
Wasco
Shaniko
Antelope
Condon
Fossil
GILLIAM
WASCO
Arlington
Heppner Jc.
Boardman
Ione
Lexington
Heppner
MORROW
Umatilla
Cold Springs
Pendleton
Pilot Rock
Weston
UMATILLA
Elgin
Troy
Flora
Imnaha
Enterprise
Joseph
WALLOWA
Cove
Union
La Grande
UNION
Ukiah
Homestead
Cornucopia
N. Powder
Medical Springs
Halfway
Haines
Baker
New Bridge
Richland
Robinette
BAKER
Spray
Monument
Long Creek
WHEELER
Mitchell
Kimberly
Dayville
GRANT
Bridgeport
Rye Valley
Canyon City
Mt. Vernon
Post
Paulina
Held
CROOK
Prineville
Vale
Ontario
Nyssa
Drewsey
Juntura
Burns
Crane
Harney Lake
Malheur Lake
HARNEY
MALHEUR
Jordan Valley
Silver Lake
Summer Lake
Paisley
Lake Abert
LAKE
Plush
Lakeview
Warner Lake
Goose Lake
Beatty
Bly
Klamath Falls
Klamath Lake
Lake of the Woods
Chiloquin
Sprague River
KLAMATH
Dairy
Bonanza
Midland
LEGEND
Market Roads
State Highways


DEPARTMENT
EGON
KET ROADS
Scale of Miles
0 10 20 30 40 50
Umatilla
Cold Springs
Weston
Troy
Flora
Imnaha
Boardman
Arlington
Heppner Jc.
RIVER
Willow
Umatilla R.
Wasco
Pendleton
Pilot Rock
Lexington
Ione
Elgin
Minam
Wallowa
Enterprise
Joseph
Cove
Union
La Grande
Heppner
Ukiah
Condon
GILLIAM
MORROW
UMATILLA
UNION
WALLOWA
Shaniko
Antelope
Fossil
Spray
Monument
Long Creek
Haines
Baker
N. Powder
Medical Springs
Cornucopia
Homestead
Halfway
Robinette
New Bridge
Richland
WHEELER
Mitchell
Kimberly
BAKER
GRANT
Dayville
Canyon City
Mt. Vernon
Bridgeport
Rye Valley
CROOK
Post
Paulina
Prineville
Vale
Ontario
Nyssa
Held
Drewsey
Juntura
Burns
Crane
Malheur River
Harney Lake
Malheur Lake
MALHEUR
HARNEY
Jordan Valley
Owyhee
Summer Lake
LAKE
Paisley
Lake Abert
Plush
Lakeview
Goose Lake
Warner Lake
LEGEND
Market Roads
State Highways
R.H.R.

Under the county engineer plan for the handling of market road engineering, the counties are getting good market road locations and good construction at low costs. The plan has been most successful in those counties where the amount of work is sufficient to justify the employment of experienced and competent engineers—men in whom the counties can repose full confidence. Some engineers are given both engineering and construction work on market roads, others are given the same work on both market roads and county roads. In counties having less work, local engineers experienced in highway engineering and commanding the courts' confidence are employed on a part-time basis where available. In one county, the duties of watermaster and county engineer are combined; in others the duties of city engineer and county engineer are combined, et cetera. Department engineers act as county engineer in some counties on a part-time basis. There is noted a general application of engineering methods to county road work, so the benefits of competent engineering service are not being confined to market roads alone.

County courts are honestly making every effort to improve their market road and county road mileage as fast and as well as is possible with the available funds. They see many miles needing improvement; they see sections of their county retarded by lack of good roads, but the funds available are limited. The work must be done as economically as possible so that the greatest possible mileage is improved and the greatest good for the county realized.

The courts are studying their road problems from the engineering standpoint of comparative distance, costs, traffic demands, etc., some insisting upon abrasion tests for all-surfacing materials, whether for market roads or county roads. Some apply reconnaissance methods to the location of county roads. Many are proceeding with betterment projects, and short sections which have been traffic hazards are being corrected. Some have made extensive study of oil surface treatment of macadams, while a few counties have constructed considerable mileages of this type of surface. Many of the courts have adopted and are using State highway standard specifications on all of their county contracts. Short form proposal and contract agreement blanks are furnished to the counties for this purpose by the Commission.

The counties are able in some cases to build with county forces more economically than they can get work done by contract. This is particularly true of grading where machinery such as large graders and caterpillars can be used. The contracting of such work is made difficult by the difficulties and expense of measuring quantities, and lump sum bids are unsatisfactory.

The Commission has approved much construction work by county forces, but believes that such work should receive as much engineering supervision and should be completed to just as high standards as is contract work. Plans should be well prepared and the work should be laid out and investigated well in advance of construction, to allow a study of possible ways to better or cheapen the work. Plans are not required to any particular scale, or elaborate form, but all essential information is required to be shown.

The various county courts may tend to over-value certain of their projects; they wish to build them too wide, too straight or too good. Then on other roads they may under-estimate the importance, and tend to construct too narrow or too steep or too cheaply. There is often a tendency

to lower the standards of construction. The Commission's influence operates to overcome these tendencies and operates towards uniformity and good standards.

A differentiation is made between standards of design and standards of construction, the first deals with the width of roadbed, width of surface, grades, and maximum curvature; the second deals with the thoroughness with which the completed grade or surface follows the stakes, the thoroughness and the completeness of the construction. A road may be built to low standards of design—eight per cent grades or 12-foot roadbed or eight-foot surface—yet it should be built to high standards of construction. Standards of construction depend much upon the thoroughness of the county engineer and his forethought and planning of the work.

The Commission has allowed much latitude in standards of design. The traffic which the road will have to carry, the density of population, the nature of the country and its future possibilities are all considered.

There is a tendency for courts when dealing for right of way to grow sympathetic with some owner whose land is being crossed. The final benefit to the many is lost sight of, and without the backing of the Commission they would hesitate and poor alignment and expensive work be substituted for good alignment, shorter lines and cheaper work.

ROOSEVELT COAST HIGHWAY

At this time the outstanding and most important objective of Oregon's road building program is the completion of the construction of the Roosevelt Coast Highway. This highway is of tremendous importance to all of Western Oregon, and although in its present partially completed state, it is rendering a great and valuable service, it cannot, until its last link is completed, bring to the State the full return of development and prosperity, pleasure and profit which will inevitably follow its opening to through traffic. Realizing these facts, the State Highway Commission has been bending every effort toward the completion of this highway, and although the funds that Oregon has had available for highway construction during the past biennium have been quite limited, conhiderable progress has been made during that time in bringing about the completed condition which is so urgently desired.

Out of a total of $6,677,130.72 expended during the biennium for new highway construction work and betterment work, $2,230,023.53 (about 33⅓ per cent) was expended on the Roosevelt Coast Highway. To complete contracts under way at the close of the biennium will require a further expenditure of approximately $80,000.

Of the $2,230,023.53 expended for construction and betterment work on this highway during the two-year period, the State contributed $1,027,590.45, the Federal Government contributed $958,721.44, and the counties through which the highway passes contributed $243,711.64.

In addition to the expenditures above mentioned, the Federal Government has expended $100,177.77 in connection with forest highway work on the Roosevelt Coast Highway, and an additional expenditure of $132,868.81 by the Federal Government will be required to complete forest highway contracts under way at the close of the year.

The construction work performed on the Roosevelt Coast Highway during 1927 and 1928 has consisted of 26 miles of grading, 78 miles of rock surfacing, 47 miles of oiling, 7 miles of bituminous macadam wearing surface, 0.3 mile of paving and the construction of several bridges, chief

among which are the Soapstone Creek Bridge in Clatsop County, the Nehalem River Bridge in Tillamook County, the Rocky Creek and DePoe Bay Bridges in Lincoln County, the Schofield River Bridge in Douglas County and the Pistol River, Euchre Creek and Hunters Creek Bridges in Curry County. The above mileages of work performed include 2.8 miles of grading work and 11.0 miles of surfacing work performed on forest highway projects.

Other accomplishments worthy of mention are the installation of a ferry at the Rogue River Crossing in Curry County and the taking over by the State of the county ferry running between North Bend and Glasgow in Coos County. Both of these ferries are now being maintained and operated by the State as free ferries.

The total length of the Roosevelt Coast Highway from its northern terminus at Astoria to the point where it enters the State of California, is 405 miles. Of this length 58 miles are, at the end of 1928, paved; 7 miles are surfaced with bituminous macadam; 47 miles are surfaced with oiled macadam; 214 miles are surfaced with unoiled crushed rock and gravel surfacing; 12 miles are graded ready for surfacing, and 67 miles are unimproved. Contracts in progress will increase the mileage of graded road to 17, and will decrease the mileage of unimproved distance to 62.

The expenditures made to date in connection with the improvement of the Roosevelt Coast Highway, inclusive of expenditures in connection with forest projects, have aggregated slightly more than $11,650,000. Of this amount, the State has contributed $6,950,000, the Federal Government $3,000,000, and the counties $1,700,000.

Reference to the State highway map which appears in Part Four of this report, will give a clear idea as to where the improvement work so far performed has been done, and as to what portions of the highway yet remain to be improved. It will be noted that the improvement is continuous from the California line north to Reedsport and from Astoria south to Newport. These two long stretches of continuous improvement make more than 80 per cent of the total length of the highway available for use, and they open up to the motorist a very large proportion of the beautiful scenery and other interesting attractions for which the Roosevelt Coast Highway is soon to be renowned.

PAVING

Pavement construction in Oregon has been at very low ebb during the biennium just closed, less than one mile of this type of construction having been undertaken during that period. The almost complete cessation of paving work is attributable to several causes, the more important of which are: (1) the limited amount of funds that have been available for new construction work; (2) the development of bituminous macadam and oiled macadams to the point where they render quite as satisfactory service as do pavements; and (3) the fact that most, if not all, of the highways carrying a sufficiently heavy traffic to make paving necessary are already paved.

Since the beginning of the State highway construction program in 1917, the State has constructed 730 miles of pavement, which mileage together with the mileages constructed by Multnomah County and by incorporated cities and towns brings the pavement on State highway routes to a total of 895 miles, 687 miles of which is bituminous pavement and 208 miles is concrete pavement.

The paving work done during 1927 and 1928 consisted of the paving of the approaches to the new Willamette River Bridges at Albany and Harrisburg and the paving of several short unpaved gaps in the Pacific Highway and in the Albany-Corvallis Highway. The total length of the new pavement is 0.8 mile, and it is all of the Portland cement concrete type.

Multnomah County constructed 1.1 miles of concrete pavement on the newly graded south entrance of the Pacific Highway into Portland, and 3.6 miles of bituminous pavement on the portion of the Mt. Hood Highway which is between Gresham and the Multnomah-Clackamas County line.

BROKEN STONE AND CRUSHED GRAVEL SURFACING

The broken stone or crushed gravel surfacing which for many years was looked upon as a temporary type of construction has, as a result of recent developments in oiling and in bituminous macadam wearing surface construction, taken its place as a permanent and highly satisfactory type of highway surfacing. Broken stone or crushed gravel surfacing, properly treated with oil or provided with a bituminous macadam wearing surface, and properly maintained, will last indefinitely, and will render quite as good service to motor traffic as does pavement.

Practically all of the broken stone and crushed gravel surfacing recently constructed by the Highway Commission has been constructed with a view to either oiling or topping with bituminous macadam as soon as the surfacing has been thoroughly pounded down and compacted by traffic. The heavy top course of fine materials that is required in broken stone and crushed gravel surfacing that is to be maintained as a dry macadam, has been largely omitted, and the quantities thus saved have been utilized to thicken the base and sub-base courses. The strength of the surfacing is thus increased without an increase in cost.

The broken stone and crushed gravel surfacings are being constructed to widths varying from 16 to 20 feet and to thickness varying from 8 to 12 inches. The costs run from about $6,000 to about $9,000 per mile.

During the 1927-28 biennium, 209.8 miles of broken stone and crushed gravel surfacing were constructed on the State Highway System by the State and 71.1 miles were constructed on the State Highway System by the Federal Government, this latter work being of the class commonly referred to as forest highway work. Among the larger and more important of the State surfacing projects were the 28-mile section of the Roosevelt Coast Highway between Myers Creek and the Chetco River in Curry County, the 13-mile section of the same highway between the Siletz River and Otter Rock in Lincoln County, the 11-mile section of the Redwood Highway between Hayes Hill and Shattuck Corner in Josephine County, the 21-mile section of the Klamath Falls-Lakeview Highway between Beatty and the Fremont National Forest in Klamath County, the 16-mile section of the Klamath Falls-Lakeview Highway between Lakeview and Drews Valley in Lake County, the 14-mile section of the Baker-Unity Highway between Unity and Hereford in Baker County, the 15-mile section of the Oregon-Washington Highway between Lena and Vinson in Morrow and Umatilla Counties, and the 43-mile section of the John Day Highway between Unity and Brogan in Baker and Malheur Counties.

GRADING

Of a total of approximately $6,000,000, expended during the biennium for new construction and betterment work, $2,709,925.89 was expended for grading work. This expenditure has netted the State 147.7 miles of new highway roadbed and 32.9 miles of roadbed widening, besides much betterment work of a minor nature such as the widening of embankments, flattening of curves, improvement of alignment, etc.

As a result of the two years' grading operations, three more of the State highways can be placed in the list of highways for which the grading work is entirely completed. These three highways are the Redwood Highway, the Alsea Highway and the Baker-Unity Highway. Another result of these operations is the completion of the last units of grading in the 155-mile section of the Roosevelt Highway which is between Astoria and Newport, and in the 172-mile section of the same highway which is between the California State line and Reedsport.

Probably the most noteworthy grading projects of the biennium are the grade widening and alignment betterment projects between Canemah and New Era on the Pacific Highway and between the Multnomah County line and Beaverton on the Tualatin Valley Highway. These sections of highway were originally graded about 10 years ago, and at that time they were considered excellent examples of high standard construction, and it was believed that they would serve traffic adequately for many years to come. However, public demand for faster and safer highways, together with an enormous increase in the volume of traffic using these sections, has made a very material improvement in width and alignment imperative. The Canemah-New Era Section is 4.7 miles in length, and its regrading will cost approximately $150,000. The Multnomah County Line-Beaverton Section is 3.0 miles in length, and its regrading will cost $80,000. The regrading work will, in both cases, be followed by repaving, as changes in alignment and grade have made necessary the abandonment of very large proportions of the old pavement.

In addition to the above described grading work, all of which was performed under the direct supervision of the State Highway Commission, 41.9 miles of new grade construction work has been performed on State highway routes under the supervision of the Federal Bureau of Public Roads, and 23.4 miles has been performed under the supervision of counties.

The width of roadbed used on State highway work varies from 22 feet on the lighter traveled roads in mountainous country to 36 and 42 feet on heavily traveled roads in level country. On the more important State highways through mountainous country, the standard width is 24 feet between ditches in cut and 28 feet in embankment. The maximum gradient on the main highways is 5 per cent and the minimum curve radius is 200 feet. The same standards of grade and curvature apply on highways of lesser importance, except that in extreme cases 6 per cent grades and 100-foot radius curves are used.

To insure the safety of motorists, substantial wood guard fences are constructed on the outside of sharp curves and along the shoulders of high embankments. Also, at the time the roadbed is graded, all curves are banked or super-elevated in anticipation of the super-elevation of the surfacing when that is added.

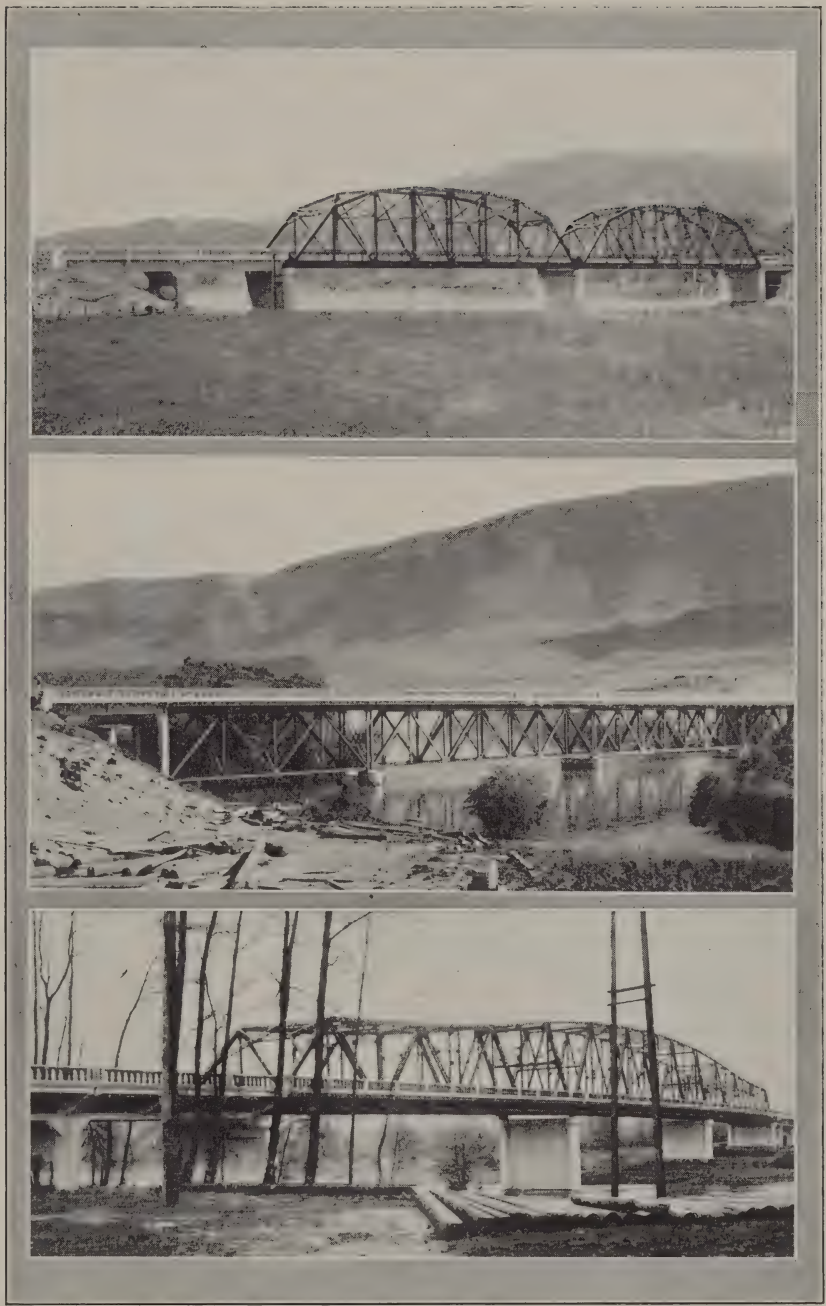
BRIDGES

During the period covered by this report, the State has constructed on its State highway system a total of 48 bridges, expending for bridge construction work approximately $960,000. In addition, the State has supervised the construction of 22 bridges built by counties on market roads and other county roads, the cost of which bridges was approximately $200,000.

The total estimated cost of structures for which designs were prepared during the biennium amounts to $1,309,457.93, which sum may be conveniently grouped or segregated as follows: $640,981.11 representing the cost of 23 bridge structures on the State Highway System, having spans in excess of 20 feet; $24,385.84 representing the cost of six bridge structures on the State Highway System having span lengths less than 20 feet; $133,347.29 representing the cost of eight structures other than bridges designed for the State Highway System; $510,743.69 representing the cost of 35 bridge structures on the market road system and on the county roads of the State.

A comparison with the report covering the activities of this Department during the preceding biennium will show a marked reduction in the number of bridge designs prepared for construction on the State Highway System, 46 designs having been prepared for major structures on the State Highway System during the preceding biennium as against 23 structures during the current biennium.

Another interesting comparison concerns the average cost per structure during the current biennium as compared with preceding bienniums. In a former biennial report it was pointed out that the average cost per bridge over the State Highway System had increased 46 per cent between the biennial period ending in 1924 and that ending in 1922, indicating that the general work of bridge construction over the State Highway System seemed to be more advanced, the remaining work consisting principally in the construction of the larger and more important structures. In a later biennial report it was noted that the development of the market road systems throughout the State had greatly increased the number of small bridge structures and had operated to place before the Bridge Department an increasing number of small bridge problems, so that the average cost per structure had decreased from $11,700 for the biennial period ending 1924, to $9,970 for the biennial period ending 1926. An analysis of the tabulation given hereinbelow indicates that for the current biennium the average cost per structure for the bridges designed amounts to $18,376, indicating a trend opposite in direction to that observed in the preceding biennium. The reason for this trend is not hard to find. With the inauguration of the market road system, the earlier bridge problems pertained largely to the smaller structures, but as the system has developed and the small bridging gradually accomplished, the counties have arrived at a point where they, in turn, could consider the construction of some of the larger crossings on their market and local road systems. During the current biennium, 35 designs were prepared for county and market road structures as against 42 designs for the same class of work prepared during the preceding biennium. The total cost of construction represented by these designs, however, amounts to $510,743.69 for the current biennium, as against $399,189.10 for the



TOP—BRIDGE OVER PISTOL RIVER IN CURRY COUNTY; CENTER—COLUMBIA RIVER HIGHWAY BRIDGE OVER JOHN DAY RIVER; BOTTOM—BRIDGE OVER WILLAMETTE RIVER AT SPRINGFIELD

preceding biennium. It is interesting to observe that the general trend in market road bridge work appears to be paralleling the previous trend on the State Highway System.

Among the more important bridges constructed on the State Highway System during the current biennium may be mentioned the crossing of the Willamette River at Springfield and the Deschutes River crossing at Maupin. The Willamette River crossing consists of a steel truss span 550 feet in over-all length, continuous over four supports, flanked on the west end by 150 feet and on the east end by 240 feet of concrete viaduct approach. The roadway width is 27 feet, with two 5-foot sidewalks and the foundations rest on solid rock. Contract for this structure was let to the firm of Lindstrom & Feigenson, of Portland, on March 27, 1928, for the amount of $127,300.

The bridge at Maupin consists of a crossing of the Deschutes River and also of the railway tracks of both the O.-W. R. R. & N. Co. and the Oregon Trunk Railway Co. The main channel span is of deck steel truss construction and the approaches are of the reinforced concrete viaduct type. The total length of the structure is 825 feet; the roadway width is 20 feet with two 3½-foot sidewalks and the contract price $94,860. Contract for this structure was awarded to the firm of Kuckenberg-Wittman Company, of Portland, on August 14, 1928.

Among the more important bridges constructed on county and market road systems during the current biennium may be mentioned the crossing of the Umpqua River at Smith's Ferry and the bridge at Scottsburg, also over the Umpqua River.

The Smith's Ferry Bridge consists of a steel truss span 450 feet in total length, continuous over three supports, flanked on either end by timber trestle approach construction. Contract for this structure was awarded by Douglas County to C. A. Catching, on March 8, 1928, in the sum of $52,156.

The Umpqua River Bridge at Scottsburg consists of a central steel truss span 632 feet in over-all length, continuous over four supports and flanked on either end by reinforced concrete viaduct approach construction. The roadway width is 24 feet; the total length 816 feet; and the contract cost of construction $97,120. Contract for this structure was awarded by the State Highway Commission for the super-road district on May 29, 1928, to the Clackamas Construction Company.

One of the important bridge engineering developments during the current biennium is the use of continuous and rigid frame construction, both in steel and concrete. While continuous trusses have been accepted by engineering practice for many years, their use in the United States has not been common and it is only during the past biennium that this type of construction has been used on the State Highway System of Oregon. Construction of this type is particularly advantageous in that stresses induced by a load in any one span are distributed to a certain extent throughout the entire structure, thus operating to increase the general rigidity of the superstructure and introduce a distinct economy in metal. The designing cost for construction of this type is higher than for the statically determinate construction types, but the savings resulting therefrom offset this cost many times.

The use of the rigid-frame idea in short span reinforced concrete construction is a much newer development than that of the continuous steel frame. While engineers have realized for many years the inherent econ-

omy in rigid-frame construction, the mathematical difficulties involved in the design of such a type rendered its adoption by engineers in general rather slow. During the past few years, considerable research has been done along this line and certain mechanical equipment devised whereby the analytical or mathematical work may be checked experimentally. Several machines of this type have been developed. Essentially, they consist of a system of micrometer microscopes and a set of gages, clamps, etc., whereby small models of the structure involved may be artifically distorted and the stresses induced by various systems of loading analyzed and tabulated. Early in the biennium the Bridge Department purchased a machine of this type and during the period covered by this report, considerable experimentation has been done and several reinforced concrete structures of the rigid-frame type have been designed and constructed on the State Highway System. The bridge over Parrott Creek on the Pacific Highway, consisting of one central span of 60 feet with six 30-foot flanking spans, is of this type. The bridge over Blue River on the McKenzie Highway, consisting of three 60-foot and two 20-foot reinforced concrete spans is another rigid-frame structure. It is estimated that on these two structures alone the saving in materials amounted to over five times the cost of the mechanical equipment purchased and the extra time involved in the design and it is confidently expected that with the development of this type of construction, thousands of dollars may be saved on the State Highway System in the cost of short span concrete structures.

During the current biennium, the Department has taken on a new activity, that of inaugurating and maintaining ferry service over two of the principal stream crossings on the Roosevelt Coast Highway. During the summer of 1927, a power ferry, known as the "Rogue" was designed and constructed by the Department for plying the Rogue River between the towns of Wedderburn and Gold Beach on the Roosevelt Coast Highway. This boat consists of a double-ended tunnel-type propeller ferry, powered by means of a 75 H. P. full diesel engine, 64 feet in over-all length and having a capacity of eight cars. The total cost of the ferry installation, includiug slips and auxiliary equipment to date, amounts to $47,506.65. Ferry service was inaugurated in October, 1927, and since that time has been maintained from 6 a. m. to 10 p. m. each day, including Sundays, or 16 hours per day. During the 14-month period since its inauguration, the total gross operating time on a 16-hour basis amounts to 6,816 hours. During this period 202 hours have been lost due to mechanical difficulty or 2.9 per cent of the total gross operating time. In addition to mechanical difficulties, there have been certain stages of the river when it has been impossible to maintain ferry service. Under extreme low tide conditions the depth of water is not sufficient and during freshet periods the extreme current velocity and presence of floating drift renders it hazardous to operate. Owing to the above causes further delays amounting to 150 hours were experienced during the 14-month period above, representing an additional loss of 2.2 per cent of the total gross time. The total percentage of lost time due to all causes, therefore, amounts to 5.1 per cent.

On May 1, 1928, the State took over the operation of a scow ferry at Bagnalls Crossing, situated a few miles above the Rogue River ferry site, operating the same as emergency equipment. The operation of this ferry has reduced the total net lost time to 230 hours, or 3.4 per cent of the total time. From the above, therefore, it may be observed that during

the 14-month period of ferry operation, uninterrupted service has been maintained for 96.6 per cent of the total gross time during which the ferry has been scheduled for operation.

The ferry "Roosevelt," previously owned by Coos County and plying between North Bend and Glasgow across Coos Bay on the route of the Roosevelt Coast Highway, was taken over by the State of Oregon, February 28, 1928. This is a steam operated ferry, having a capacity of 19 cars. The average operating cost to the State is represented by the following figures:

	Aver. per Mo.
Salaries	$1,237.00
Fuel	206.22
Supplies	64.92
Repairs	611.53
Miscellaneous	42.70
Total	$2,162.37

Sixteen-hour ferry service is maintained at this point as in the case of the ferry "Rogue," and during the period of its operation by the State, service has been practically uninterrupted with the exception of about 15 hours which have been lost due to repairs to the mechanical plant, the necessity for washing down the boilers, etc., etc. The total percentage of time lost amounts to 0.5 per cent of the total time, leaving the percentage of uninterrupted service 99.5 per cent.

Among the important building structures designed and constructed during the current biennium may be mentioned the Park House at Emigrant Springs, contract for which was let to the firm of Frick & Belvail on April 19, 1927, in the amount of $19,314.54 and the Shops and Division Office Building at La Grande, contract for which was let to W. C. Kelley March 27, 1928, in the amount of $38,960.

The following tabulation is a summary of departmental activities as regards the design and construction of structures:

1.	Number of designs prepared for bridges 20 feet or more in length, on the State Highway System	23
	Total estimated cost of the above	$640,981.11
2.	Number of special designs prepared for bridges less than 20 feet in length, on the State Highway System	6
	Total estimated cost of the above	$ 24,385.84
3.	Number of designs prepared for structures other than bridges	8
	Total estimated cost of the above	$ 133,347.29
4.	Number of designs prepared for bridges not on State Highways	35
	Total estimated cost of the above	$ 510,743.69
5.	Total number of designs prepared	72
	Total estimated cost of all structures for which designs were prepared	$1,309,457.93
6.	Number of bridges on which construction work was performed during the biennium	84
	Total cost of bridge construction completed during the biennium	$1,169,117.84*
7.	Total number of structures other than bridges upon which construction was performed during the biennium	11
	Total cost of above	$ 123,543.96
8.	Total cost of bridge maintenance and bridge betterment work performed during the biennium	$ 237,700.20
9.	Total cost of bridge construction, bridge maintenance and bridge betterment performed during the biennium	$1,530,362.00*

* This amount is inclusive of the cost of county bridges built under the supervision of the State Highway Commission.

BETTERMENT WORK

Betterments include all improvements of a material nature that are made upon the highways subsequent to the period of initial construction. Included in this class of improvement are the widening and straightening of grades, the widening and thickening of pavement, the erection of guard fences, the replacement of wood structures by those of a more permanent type, the planting of trees and shrubs along the highway, et cetera.

For departmental purposes, betterments are classified in two groups, major betterments and minor betterments. In the class of major betterments are included those projects of a major nature which are handled either by contract or by large State force gangs working independent of the regular patrol organizations. Ordinarily the widening and thickening of pavement is a major betterment. Large regrading jobs also fall into this category.

Minor betterment includes such betterment as is performed by small crews such as are used on general maintenance work. Small jobs of widening and straightening roadbed, the planting of trees, the erection of guard fences, and the installation of additional culverts, are among the items classified as minor betterment. During the past biennium bituminous macadam was classified as minor betterment. This work has reached such proportions that in the future it will be classified as major betterment.

During the past biennium, the total expenditures for major betterment work amounted to $660,320.71. For the detail of this expenditure by projects see Table X in Part Three of this report. During the same period there was expended for minor betterments the sum of $942,903.38, which amount comprises the following items:

EXPENDITURES FOR MINOR BETTERMENTS

Item	1927		1928	
	Miles	Cost	Miles	Cost
Concrete Pavement (widening, resurfacing, etc.)	.....	$ 134.37	.....	$ 1,285.54
Bituminous Pavement (widening, resurfacing, etc.)	.....	7,747.43	.....	4,083.30
Bituminous Macadam Resurface on Pavement	0.80	6,934.37	1.45	6,660.75
Skid-proof Treatment on Bituminous Pavement	2.90	8,167.89	9.8	27,990.73
Bituminous Macadam Shoulders to Pavement	1.10	2,750.00	2.95	9,636.50
Bituminous Macadam Construction (Incl. Rock)	3.18	21,854.13	104.28	429,198.50
Rock Shoulders to Pavement (Construction)	.....	2,451.98	.....	7,227.60
Rock or Gravel Surfacing	.....	10,691.12	.....	11,733.15
Grade Widening and Ditching	.....	42,720.70	.....	71,122.54
Culverts and Drains	.....	68,808.97	.....	73,884.35
Miscellaneous Structures	.....	2,032.37	.....	6,064.30
Guard Fence Construction	.....	6,361.51	.....	9,220.35
Snow Fence Construction	.....	1,882.62	.....	2,343.68
Bridge Betterment	.....	36,234.70	.....	47,806.73
General Superintendence	.....	173.46	.....	3,677.07
Miscellaneous	.....	2,318.14	.....	8,804.53
Total	.....	$221,263.76	.....	$721,639.62

Perhaps the major feature in connection with the betterment work during the past biennium consisted in the construction of bituminous macadam surfacing, amounting to a total of 107.3 miles. This began in an experimental way in 1927, during which year approximately 3.29 miles of various types of bituminous macadam were constructed. The results were such that a much greater mileage was built during 1928. Bituminous macadams differ from oil macadams in that it has a much greater thickness. It is for that reason that bituminous macadam is classed as betterment while oil macadam is classed as maintenance.

An abstract of the various specifications and the costs in relation thereto, is given below.

ABSTRACT OF SPECIFICATIONS FOR BITUMINOUS MACADAM

Specifications	L-1	L-2	C-2	L-4	M-2
Compacted Thickness	1 5/8"	2"	2"	2 3/4"	4"
BASE					
Gallons of Oil per sq. yd.	.35	.35	.35	.35	.35
Grade of Oil or Tar	Light oil	Light oil	Light tar	Light oil	Light oil
Quantity of rock	Enough to prevent splashing				
TOP					
Grade of Oil	95%	95%	Heavy tar	95%	95%
1st application of oil, gals.	.10	.10	.10	.10	.10
1st spread of rock, cu. yds.	.0195 C	.016 C	.016 C	.016 C	.040 D
2d application of oil, gals.	.25	.20	.20	.20	.50
2d spread of rock, cu. yds.	.333	.25	.25	.20	.20
3d application of oil, gals.	.0125 B	.016 C	.016 C	.016 C	.016 C
3d spread of rock, cu. yds.	.0125 A	.0125 B	.0125 B	.016 B	.040 D
4th application of oil, gals.	.....	.333	.333	.20	.50
4th spread of rock, cu. yds.	.....	.0125 A	.0125 A	.016 C	.016 C
5th application of oil, gals.	.....	.....	.....	.25	.25
5th spread of rock, cu. yds.	.....	.....	.....	.0125 B	.0125 B
6th application of oil, gals.	.....	.....	.....	.375	.375
6th spread of rock, cu. yds.	.....	.....	.....	.0125 A	.0125 A
Total Oil in top, gals.	.683	.883	.883	1.325	1.925
Total Rock in top, cu.yds.	.0445	.0570	.0570	.890	.1370

The quantities given in the above table are quantities per square yard of surfacing. The thicknesses shown include one-half inch of penetration of light oil or tar into the surfacing upon which the bituminous macadam is constructed. The letters following the quantities of rock refer to the size or grade of rock used, the sizes or grades being as follows: Grade A, ½ to ⅓; Grade B, ¾ to ½; Grade C, 1½ to ¾, and Grade D, 2½ to 1½.

The bituminous macadam surfacing is smooth and the skid-proof properties inherent in the type constructed affords a traction which, during stormy weather, gives a safety to driving, the value of which is hard to measure in dollars and cents. The costs which are shown above are quite moderate. It is felt that this specification is a still further intermediate type between an oiled macadam and a pavement, and that there is a definite place for its use in this State.

The method of construction—one-half width at a time—results in very little delay or inconvenience to the traveling public, inasmuch as the surfacing can be driven over without the danger of asphalt adhering to the car as soon as the surface is completed, and the one-way traffic control seldom exceeds one mile at a time.

Experiments were conducted during 1928 with reference to the plant mixed type of bituminous macadam, both on a macadam base and as a

redress on bituminous pavement. The broken stone or crushed gravel materials were mixed with 95 per cent asphaltic oil in the Highway Department's portable paving plants. The stone was first dumped into the mixer and dried, after which the asphaltic binder was added at a temperature of 200 degrees F. The specification for the various mixes is given in an accompanying table. It will be noted that very little sand is used in the mineral aggregate, which allows a mechanical lock of the coarser particles, and the lower per cent of asphalt, together with the less amount of sand, gives a very skid-proof surface. The mixture was raked and rolled according to the standard practice with asphalt mixtures, after which the surface was flush coated with about 0.2 gallon of oil to the square yard, followed by a spread of screenings varying in size from one-half to one-eighth inch.

The cost of the plant mixed bituminous macadam was approximately $6.07 per ton in place. It is thought that by the use of a larger plant and the use of a mechanical spreader and rakes, the cost can be cut to about $5 per ton.

Further investigation of this type of bituminous macadam will be made during 1929, and if the low cost as stated above, can be realized by larger plants, the specification will undoubtedly supplant the penetration types, inasmuch as the plant mix gives a much more uniform distribution of the mineral aggregate and asphaltic binder, while the use of the mechanical spreader and rakes will afford a very smooth surface. The chief objection to a bituminous pavement—the slippery surface—is eliminated by this specification.

SPECIFICATION FOR PLANT MIXED BITUMINOUS MACADAM

Passing	*Retained on*	*Base Mix (Per cent)*	*Top Mix (Per cent)*
2″ cir. ring	1½″ cir. ring	8 to 12	100
1½″ cir. ring	¾″ cir. ring	26 to 38	24 to 36
¾″ cir. ring	½″ cir. ring	12 to 20	15 to 25
½″ cir. ring	¼″ sq. mesh	14 to 22	15 to 25
¼″ sq. mesh		15 to 25	20 to 30
95 per cent asphaltic oil binder		2½ to 4½	3 to 5

During 1927, a skid-proof treatment of tar and screenings, one mile in length, was placed on the pavement at Aurora. This has now stood nearly two years and is still very effective in affording traction to the pneumatic tires in wet weather. Ten miles of this type of treatment were placed in particularly slippery spots on the pavement on the lower Columbia River Highway during 1928. This is an example of one of the methods the Highway Commission has used in its endeavor to safeguard the public.

During 1926, 19 miles of rock shoulders on the Pacific Highway between Aurora and Salem were treated with an oil surface treatment. This was classified as a maintenance operation. During 1927 and 1928, four miles of bituminous macadam shoulders to pavement were built, under a minor betterment classification, since an appreciable thickness was added. Both jobs have materially decreased the maintenance costs of pavement shoulder upkeep and afforded a smooth but skid-proof surface.

UNIT COSTS OF BITUMINOUS MACADAM CONSTRUCTION, 1928

Section	Thickness of compacted material in inches	Specifications	Length in miles	Cost		Cost Per Mile		Cost Per Square Yard	
				Rock cost included	Rock cost excluded	Rock cost included	Rock cost excluded	Rock cost included	Rock cost excluded
Placed on Rock Surfacing:									
Sandy-Rhododendron	*	*	19.98	$ 69,337.58	$ 48,356.13	$ 3,470.00	$2,420.00	$ .328	$ .229
Seaside-Cannon Beach	1 1/2	L–2	2.77	9,447.05	7,308.50	3,410.00	2,638.00	.323	.250
Blue Bucket Section	2 1/4	L–4	1.80	12,366.61	7,768.11	6,870.00	4,316.00	.650	.408
Coquille-Myrtle Point	2 1/4	L–4	9.01	55,311.93	34,276.53	6,139.00	3,804.00	.581	.360
Medford-Trail	1 1/2	L–2	22.42	78,129.59	54,780.21	3,485.00	2,443.00	.330	.231
Trail-Prospect	1 1/8	L–1	22.24	68,250.75	48,304.80	3,069.00	2,172.00	.291	.205
Holmes Gap	2 1/4	L–4	0.39	2,480.82	1,570.23	6,361.00	4,026.00	.602	.381
Sheridan-Valley Junction‡	2 1/4	L–4	9.47	62,856.39	37,419.83	6,637.00	3,951.00	.565	.336
Beaver-Hebo	2 1/4	L–4	1.00	16,194.00	4,480.00	6,194.00	4,480.00	.586	.424
Gaps, Stanfield-Pendleton	1 1/2	L–2	5.92	25,565.76	21,358.26	4,319.00	3,608.00	.408	.341
Island City-Elgin	2 1/4	E	5.37	27,233.64	24,806.04	5,071.00	4,619.00	.480	.437
Foots Creek-Gold Hill†	1 1/8	L–1	.59	2,587.98	2,062.98	4,386.00	3,496.00	.415	.331
Beaver-Hebo†	1 1/8	PL-1	3.32	9,436.40	6,404.90	2,842.00	1,929.00	.269	.182
			104.28	$429,198.50	$298,894.52	$ 4,101.00	$2,866.00		
Placed on Bituminous Pavement:									
M. P. 90, West Side Highway	1 to 8	.....	.....	$ 1,120.09	.....	$11,200.00	.....	$1.060	.....
M. P. 65, Pacific Highway	1 1/4	PL–2	.10	476.86	.....	4,768.00	.....	.451	.....
Sheridan-McMinnville	1 1/4	PL–2	.75	3,987.17	.....	5,316.00	.....	.503	.....
Sheridan-McMinnville	.....	L–2	.50	1,976.63	1,076.63	3,953.00	2,153.00	.374	.....
Summary by Specification and Thickness:									
Specification E, 2 1/4-inch thickness			5.37	$ 27,233.64	$ 24,806.04	$ 5,071.00	$4,619.00	$ .480	$ .437
Specification L-1, 1 1/8-inch thickness			22.24	68,250.75	48,304.80	3,069.00	2,172.00	.291	.205
Specification PL-1, 1 1/8-inch thickness			3.91	12,024.38	8,467.88	3,075.00	2,166.00	.291	.205
Specification L-2, 1 1/2-inch thickness			31.61	115,119.03	84,523.60	3,641.00	2,674.00	.344	.253
Specification PL-2, 1 1/4-inch thickness			.85	4,464.03	.....	5,252.00	.....	.497	.....
Specification L-4, 2 1/4-inch thickness			21.67	139,209.75	85,514.70	6,405.00	3,946.00	.578	.356
Miscellaneous			19.58	69,337.58	48,356.13	3,470.00	2,420.00	.328	.229

* Constructed under various specifications with thickness varying from 1 1/8 to 3 1/2 inches.
† Plant mixed.
‡ 20 feet in width. Balance constructed 18 feet in width.

MAINTENANCE WORK

Maintenance is distinguished from betterment in that it includes such work as is necessary to keep the highways and their appurtenances in good condition, and to prevent the depreciation of the capital investment. As a matter of convenience for departmental purposes, maintenance is separated into two classes: special maintenance and general maintenance.

MAINTENANCE TABLE "A"
TOTAL AND UNIT MAINTENANCE COSTS FOR YEAR 1927

Item	General Maintenance Charges	Special Maintenance Charges	Total Maintenance Charges	Miles Maintained	Total Unit Costs Per Mile
1. Pavement					
(a) Concrete Pavement	$ 9,702.10	$	$ 9,702.10	188	$ 52.00
(b) Bituminous Pavement	137,698.73	.....	137,698.73	537	256.00
(c) Rock for bit. pav. repairs	.....	7,777.76	7,777.76	.....	.....
2. Shoulders to Pavements					
(a) Concrete shoulders	505.23	.....	505.23	12	42.00
(b) Oiled or bit. mac. shoulders	7,394.35	.....	7,394.35	23	321.00
(c) Rock or gravel shoulders	52,611.61	.....	52,611.61	690	76.00
(d) Cr. rock stock piled for shoulders	.....	.....	.....	.....	.....
3. Bituminous Macadam					
(a) Maintenance of Surface	.....	.....	.....	.....	.....
(b) Crushed rock stock piled for bit. mac, maintenance and 1928 construction	.....	25,951.49	25,951.49	.....	.....
4. Oiled Macadam					
(a) New oiling	316,557.00	.....	316,557.00	381	831.00
(b) Re-oiling	242,095.00	.....	242,095.00	504	480.00
(c) Maint. oiled surface	264,908.68	.....	264,908.68	766	346.00
(d) Crushed rock stock-piled for maint. oiled macadam and 1928 construction*	.....	333,929.04	333,929.04	.....	.....
5. Rock or Gravel Surface					
(a) Ordinary maintenance	362,564.42	.....	362,564.42	1440	252.00
(b) Unusual maintenance	56,526.67	.....	56,526.67	1440	39.00
(c) Rock used in maintenance	.....	174,451.48	174,451.48	.....	.....
(d) Resurfacing	.....	239,341.86	239,341.86	69	3,469.00
6. Roadbed and Right of Way					
(a) General Maintenance	275,879.30	.....	275,879.30	3179	87.00
(b) Removal of slides	162,941.49	.....	162,941.49	3179	51.00
(c) Cutting and burning weeds	38,832.66	.....	38,832.66	3179	12.00
(d) Guard fence	20,140.02	.....	20,140.02	3179	6.00
7. Bridges					
(a) Bridge structures	67,094.38	3,529.06	70,623.44	3179	22 00
(b) Bank protection and stream control	.....	7,545.53	7,545.53	3179	2.00
8. Snow removal	135,237.00	.....	135,237.00	3179	43.00
9. Road signs and traffic strips	19,803.02	.....	19,803.02	3179	6.00
10. General superintendence	98,001.77	.....	98,001.77	3179	31.00
11. Miscellaneous	45,997.44	.....	45,997.44	3179	14.00
	$2,314,490.87	$ 792,526.22	$3,107,017.09	3179	$ 980.00

* $140,074.00 used during 1927 for oiling and re-oiling and maintenance.

No unit costs are shown opposite the various types of improvement with relation to the cost of stock piling maintenance materials inasmuch as the stock piles will last for several years. Records of the amounts used per year is kept, and the relation of the total costs of the unoiled and oiled macadams are shown in separate tables.

The term "special maintenance" is applied to those features involving major maintenance operations which are carried on either by contract or large State force gangs. The resurfacing of macadams and the crushing and stock-piling of maintenance materials are examples of this class of work. This work is in the nature of replacements and is termed reconstruction by some States, therefore not appearing in their reports as

a maintenance charge. However, since it replaces the loss of the capital investment, it is properly a charge against maintenance. The term "general maintenance" covers that class of operations carried on solely by State forces and, for the major part, the activities of permanent patrol gangs. It also includes the work performed by the State paving plants and the oiling crews which operate in specially organized extra gangs separate and apart from the regular patrols.

MAINTENANCE TABLE "B"
TOTAL AND UNIT MAINTENANCE COSTS FOR YEAR 1928

Item	General Maintenance Charges	Special Maintenance Charges	Total Maintenance Charges	Miles Maintained	Total Unit Costs Per Mile
1. Pavement					
(a) Concrete pavement	$ 13,409.71	$	$ 13,409.71	189	$ 71.00
(b) Bituminous pavement	142,467.42		142,467.42	536	266.00
(c) Rock for bit. pav. repairs					
2. Shoulders to Pavements					
(a) Concrete shoulders	353.32		353.32	12	30.00
(b) Oiled or bit. mac. shoulders	1,490.45		1,490.45	23	65.00
(c) Rock or gravel shoulders	47,856.50	7,884.47	55,740.97	691	81.00
(d) Crushed rock stock piled for shoulders		7,996.99	7,996.99		
3. Bituminous Macadam					
(a) Maintenance of surface					
(b) Crushed rock stock piled for bit. mac. maintenance		27,352.72	27,352.72		
4. Oiled Macadam					
(a) New oiling	236,917.10		236,917.10	240	987.00
(b) Re-oiling	387,645.46		387,645.46	508	763.00
(c) Maintenance oiled surface	316,447.28		316,447.28	1069	297.00
(d) Crushed rock stock piled for maint. oiled mac. and 1929 oiling		315,660.36	315,660.36		
5. Rock or Gravel Surface					
(a) Ordinary maintenance	325,520.78		325,520.78	1366	238.00
(b) Unusual maintenance	81,545.48		81,545.48	1366	60.00
(c) Rock used in maintenance		107,445.60	107,445.60	1366	79.00
(d) Resurfacing		369,837.47	369,837.47	83	4,456.00
6. Roadbed and Right of Way					
(a) General maintenance	267,997.85		267,997.85	3366	80.00
(b) Removal of slides	150,445.44		150,445.44	3366	45.00
(c) Cutting and burning weeds	45,904.86		45,904.86	3366	14.00
(d) Guard fence	13,781.88		13,781.88	3366	4.00
7. Bridges					
(a) Bridge structures	94,398.70	4.84	94,403.54	3366	28.00
(b) Bank protection and stream control				3366	
8. Snow removal	137,816.26		137,816.26	3366	41.00
9. Road signs and traffic strips	18,271.03		18,271.03	3366	5.00
10. General superintendence	117,298.37		117,298.37	3366	34.00
11. Miscellaneous	24,704.19		24,704.19	3366	7.00
	$2,424,272.08	$ 836,182.45	$3,260,454.53	3366	$ 968.00

No unit costs are shown opposite the various types of improvement with relation to the cost of stock piling maintenance materials, inasmuch as the stock piles will last for several years. Records of the amounts used per year are kept, and the relation of the total costs of the unoiled and oiled macadams are shown in separate tables.

The expenditures for general maintenance during the past biennium amounted to $4,738,726.95; of this amount $2,314,490.87 was expended during 1927 and $2,424,272.08 during 1928. The detailed statements of these expenditures, together with statements of the various classes of the maintenance work performed and the per mile cost thereof, appear in Maintenance Table "A" with reference to the year 1927 and in Maintenance Table "B" for the year 1928.

The work accomplished under the head of general maintenance has included, in addition to the general work of the upkeep of 3,366 miles of State highways, the conversion of 621 miles of rock and gravel surfacings into oiled macadams.

The expenditures for special maintenance for the past two years amounted to $1,628,708.67, of which $792,526.22 was expended during 1927 and $836,182.45 during 1928. Included in this cost was the resurfacing of 152 miles of broken stone or gravel surfaced roads and the stock-piling of approximately 700,000 cubic yards of crushed gravel or broken stone for use in connection with maintenance operations. A detailed analysis of the above costs appears in Maintenance Tables "A" and "B."

In the articles that follow, some of the more important and more interesting phases of the maintenance operations are taken up and separately discussed under the headings: patrol maintenance, bituminous pavement repair work, oiled macadams, snow removal and drainage tunnels.

PATROL MAINTENANCE

For maintenance purposes, the State highways are divided into small sections, which sections are termed patrols, and which vary in length from 15 to 50 miles in accordance with the type of surface, climatic conditions and character and density of traffic. The change from a lower to a higher type of surface, for instance, from macadam to an oiled macadam or pavement, many times permits the extension of a patrol section which materially reduces the charge for labor, materials and equipment. Each patrol section is in charge of a working foreman, designated as the patrolman, who is held directly responsible for the condition of his particular patrol. The patrolmen are furnished with trucks, graders and other equipment and the necessary small tools and supplies, and for the care and upkeep of these, they are held strictly accountable.

The work of the patrol gang consists of the blading and dragging of macadam surfacing, the sanding of pavement, the filling of cracks in concrete pavement, the repairing of pavement, bituminous macadam, and oil treated macadam surfacing, the cleaning of ditches and culverts, the removal of snow, and such other work as is necessary to keep the highways in good condition.

A number of the patrols are provided with equipment sheds in which to store and house the equipment and supplies. In certain instances in isolated districts, the patrolmen are furnished with houses for their families, for which houses they are charged a rental sufficient to pay interest and to cover depreciation on the investment.

OILING OF CRUSHED ROCK AND GRAVEL SURFACING

It is true in this State, as in most others, that gravel and broken stone macadam is, on account of its relatively low first cost, the dominant type of surfacing for highways. In view of the rapid increase in traffic, it became necessary in the interests of economical maintenance, to endeavor to preserve these surfaces from the disintegration that became more and more manifest as the traffic increased. Untreated macadams are dusty in proportion to the traffic, and a rapid loss of thickness is evident by reason of the fines being sucked out of the macadam by the fast moving pneumatic tires, and the small stones being thrown entirely off the roadbed. This decrease in thickness is quite marked and totals a huge annual expense in maintenance charges. Moreover, the loss to the motorist, due to the excessive tire wear and the injury caused by the fine dust to the working parts of the motor, the chassis and the upholstery, by reason of the operation of the motor vehicle over loose, dusty, and rough macadam surfaces, is probably much greater than the loss in maintenance and upkeep costs to the State. Inasmuch as the motor car owner ultimately pays both charges, he is doubly interested. To remedy this condition, the State Highway Commission in 1923 began the use of asphaltic oils and tars as a surface treatment for macadam.

While the results obtained from the use of oil in surface treatments have, on the whole, been very successful, and have given a dustless and smooth hard surface resembling pavement, the public should not confuse the issue, but should remember that while, as a form of maintenance for macadam roads, this type is very efficient, it is not to be considered a substitute for pavement. As the traffic further increases on the highways in question, better and more expensive types of surface will be required. In certain places bituminous macadams can be used as an intermediate type between oiled macadam and pavement. It is hoped that the use of bituminous oils will conserve the foundations of broken stone and gravel materials until such reconstruction is required and funds are available for its performance.

Analysis of the costs shown in Maintenance Tables "A" and "B", hereinbefore given, indicates that the cost of the maintenance of the rock or gravel surfacings that have been treated by oil are higher than the cost of the maintenance of the untreated surfacings. This apparent inconsistency is explained as follows:

Maintenance of macadam surface is primarily a function of the traffic. Some of the rock or gravel surfacings carry a very heavy traffic, while on other sections this item is quite nominal. The cost of the surface maintenance of some of the low tsaffic roads avenages $100 pes mile or less, while the sections which are treated with oil are those which carry the heavier traffic with the correspondingly higher maintenance cost. Hence, it is apparent why the average cost on the untreated sections is lower than the average cost on the treated sections. However, the average years cost of upkeep on those sections which were treated with oil was less after the treatment than before. This will be further explained later on.

It is to be borne in mind that the surface treatment with oil stabilizes the rock or gravel surfacing to the end that there is much less wear on the macadam, and the loss of fines is minimized. In consequence, the

oil surface treated roads are able to stand for a longer period without the necessity of resurfacing than are the untreated sections. There is, therefore, considerable saving in the annual charge for resurfacing, which saving increases in proportion to the increase in traffic.

UNIT COSTS OF OILING

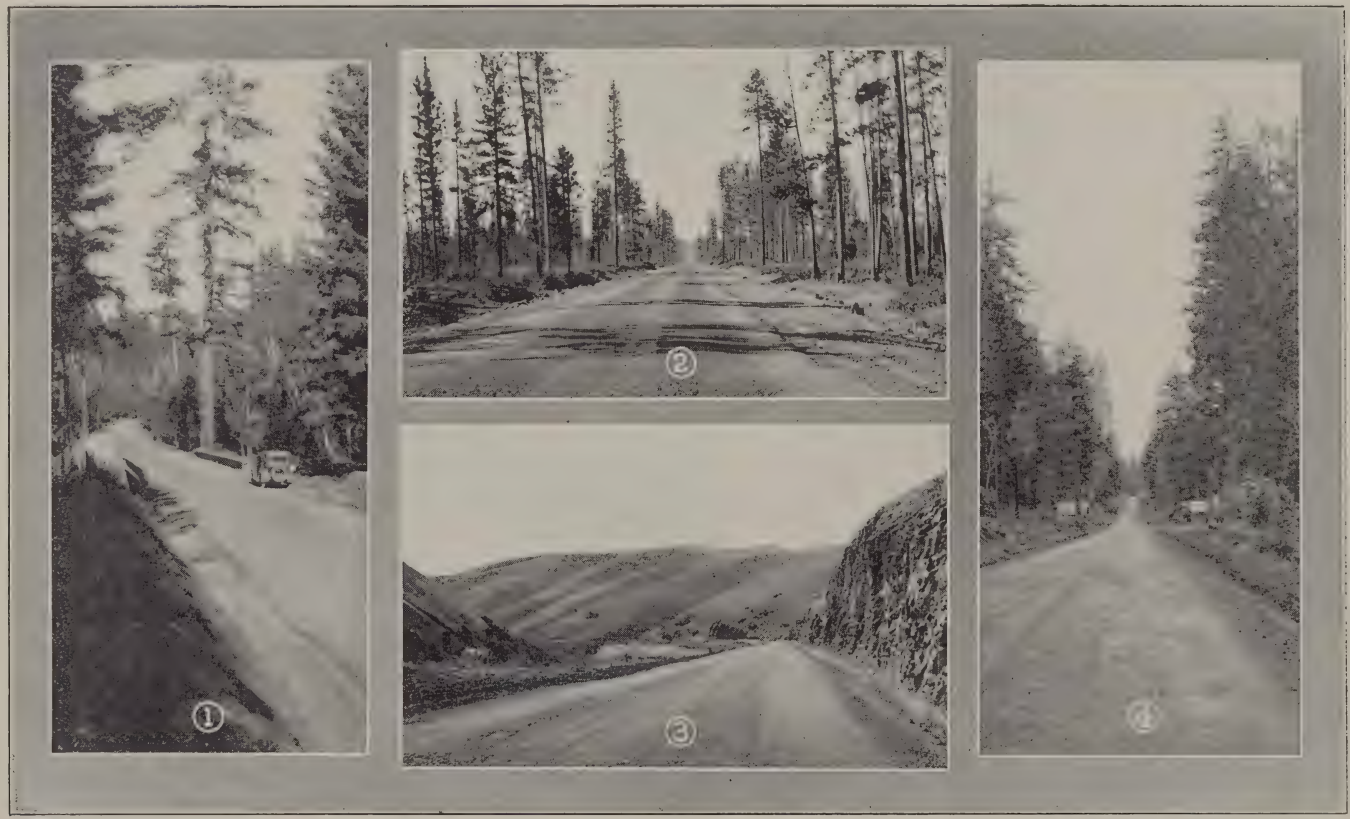
Year	Specification	Miles Oiled	Cost Per Mile		Cost Per Sq. Yd.	
			Rock Cost Excluded	Rock Cost Included	Rock Cost Excluded	Rock Cost Included
1927	B-1	195	$ 640	$ 695	$ .060	$ .060
1927	G-4	60	897	1,072	.084	.101
1927	G-1	126	1,099	1,347	.104	.127
Average for 1927		381	$ 832	$ 968	$ .078	$ .091
1928	B-3	22	$1,111	$1,420	$ .105	$ .134
1928	B-2	101	695	812	.065	.076
1928	G-4	17	892	1,192	.084	.112
1928	G-1	65	1,145	1,492	.108	.141
1928	G-3	29	1,237	1,625	.117	.153
1928	N-2	6	1,022	1,022	.096	.096
Average for 1928		240	$ 942	$1,182	$ .089	$ .111

UNIT COSTS OF REOILING

Year	Specification	Miles Reoiled	Cost Per Mile		Cost Per Sq. Yd.	
			Rock Cost Excluded	Rock Cost Included	Rock Cost Excluded	Rock Cost Included
1927	B-1	285	$ 375	$ 445	$ .036	$ .042
1927	G-4	108	501	667	.047	.064
1927	G-1	111	740	940	.070	.089
Average for 1927		504	$ 482	$ 602	$ .045	$ .057
1928	B-1	52	$ 422	$ 524	$ .033	$ .049
1928	B-2	150	542	732	.051	.069
1928	C-1	11	380	384	.035	.036
1928	G-1	38	1,130	1,464	.107	.138
1928	G-3	102	1,040	1,470	.098	.139
1928	G-3*	19	1,730	2,528	.163	.239
1928	G-4	123	654	954	.062	.090
1928	N-2	9	1,125	1,125	.106	.106
1928	N-3	3	1,500	1,500	.142	.142
1928	N-4	1	2,290	2,290	.216	.216
Average for 1928		508	$ 760	$1,042	$ .072	$ .098

* Includes heavy patching.

The first oil treatments used in this State were of the nature of dust palliatives, use being made of light asphaltic oils of the kind commonly known as fuel oil. The cost of this treatment was about $650 per mile. Each year since that time, experiments have been conducted on a small scale looking toward the improvement of the oil surface treatments. It was found that the light oils tended to emulsify and wash out during the winter season and that, in certain cases, the cost of patching was quite



OILED MACADAM ROADS. 1. REDWOOD HIGHWAY. 2. THE DALLES-CALIFORNIA HIGHWAY SOUTH OF BEND. 3. THE DALLES-CALIFORNIA HIGHWAY NEAR TYGH VALLEY. 4. CRATER LAKE HIGHWAY

high. Furthermore, it was necessary to re-oil each year with the attendant inconvenience to the public. However, many miles of this type have stood up to a remarkable degree and the costs of maintenance have been quite nominal, especially in the dry sections of the state.

A few oils of 80 per cent asphalt content were used in 1926 with such success that plans were made to secure proper heating equipment and to insulate the oilers in order to use the 95 per cent asphaltic oil during 1927.

Three hundred miles of oiled macadam using the 95 per cent asphaltic oil for the top course were laid during the past biennium, and these sections have held up under traffic ranging up to 1,500 cars per day, with very nominal maintenance costs. The major portion of the sections laid in 1927 are in splendid condition at the present time.

ABSTRACT OF OILING SPECIFICATIONS

Materials	Specifications							
	B-1	B-2	B-3	G-1	G-4	G-3	N-2	N-3
Compacted thickness	¾"	⅞"	1¼"	1	¾"	1¼"	2	3
BASE								
Grade of oil	No.1L	No.1L	No.1L	No.1L	No.1L	No.1L	Scarify base 2" deep	
Oil, gals.	.35	.35	.50	.35	.35	.35		
Rock, cu. yds.	Enough to prevent splashing							
TOP								
Grade of oil	No.1L	No.2L	No.1L	95%	95%	95%	No.2L	No.2L
First application:								
Oils, gals.	.35	.35	30	.35	.25	.20	.50	.50
Rock, cu. yds.	.005AB	.0075	.0075AB	.0175	.008B	.012B	.....	.....
Second application:								
Oils, gals.	.....	.....	.....	.....	none	.22	.50	.50
Rock, cu. yds.	.....	.....	.....	.....	.005A	.011A	.....	.....
Third application:								
Oils, gals.	.....	.....	.....	.....	.....	.....	.....	.50
Total oil, gals.	.70	.70	.80	.70	.60	.77	1.00	1.50
Total rock, cu. yds.	.005	.0075	.0075	.0175	.013	.023	none	none

The quantities given in the above table are quantities per square yard of surface. The thicknesses shown include a three-quarter-inch penetration of light oil into the surfacing upon which the oiled courses are placed. The letters following the quantities of rock refer to the size or grade of rock used, the sizes or grades being as follows: Grade A, ½ to ⅛ inch, Grade B, ¾ to ½ inch, Grade AB, ¾ to ⅛ inch. A ten-ton roller is used in connection with specifications G-4 and G-3. The road mixed method of construction is employed under specifications N-2 and N-3, the mixing being effected by means of road graders.

By the end of 1928, 1,196 miles of macadam surface had been surface-treated with oil. However, during 1927 and 1928, 68 miles of the oiled surface were covered with bituminous macadam, and 43 miles were scarified and reconstructed. The 43 miles have been reclassified as unoiled macadam pending their retreatment. This leaves a total of 1,085 miles of oiled macadam at the close of 1928—of which 19 miles is of the road-mixed type, 381 miles of the light-oil-surface-treated type, and 685 miles of the heavy-oil-surface-treated type.

The oiled macadams have now been under maintenance for a sufficient period to form an accurate opinion of the relative cost of the total maintenance of the untreated and oil-surface-treated types. To this end, a comparison is herein given of the maintenance cost of the mileage of macadams that have been surface treated with oils to date, both before and after treatment.

The total cost of the oiling, reoiling and routine patching of the 1,069 miles completed and under maintenance by 1928, representing the total cost of the maintenance of the oiled macadam from the inception of this program during the year of 1923 until the close of 1928, amounted to the sum of $2,895,134, which amount includes the costs of the rock and gravel screenings used. By reference to the mileage table showing the miles of this type of surface under maintenance each year, it is found that the sum total of maintenance for the six-year period was 2,441 mile-years. In other words, the maintenance performed during the period was the equivalent of the maintenance of 2,441 miles for one year, which at a total cost of $2,895,134 equals $1,186 per mile per year, which represents the total yearly cost of maintenance of the oiled macadam surface. Likewise we can obtain the yearly charge for each of the various items making up this cost consisting of the original oiling, the reoiling and the routine maintenance of the oiled surface. This will be further illustrated by tables that will follow.

Now to form a comparison of the maintenance of the oiled and unoiled macadams, we will consider the maintenance charges of the same 1,069 miles that were surface treated with oil during the period, from the construction of the macadam starting in 1919, until each section was surface treated with oil.

It is to be borne in mind that only a portion of the mileage that was later oiled was constructed by 1923, the start of the oil-surface treatment. Each year some of the mileage already constructed was oiled, while other sections of new macadams were constructed. Some of the older sections had worn so thin that they were resurfaced with additional materials before they were oiled. Accompanying this report is a mileage table showing the miles of untreated macadam under maintenance each year from 1920 until 1928. Each mile shown was oiled during this period and all but 127 miles were under maintenance. The sum total of the maintenance performed amounted to 4,173 mile-years, which is the equivalent of the maintenance of 4,173 miles for one year. The cost of the routine maintenance of the untreated surface for this period amounted to $2,128,821, which includes the cost of the maintenance materials used and the cost of the filler added to replace that blown away. Dividing this sum by 4,173 miles gives a charge of $510 per mile per year. We will now consider the cost of the replacement of the worn-out materials, termed resurfacing or special maintenance. This is a deferred charge and does not take place every year, but at longer intervals, depending upon the rate of wear. Generally, after a wear of approximately four inches, this amount is replaced by resurfacing.

It will now be necessary, in order to complete the comparison, to reduce this charge to a yearly cost. By the end of 1926, and before many miles were surface-treated, 268 miles of the sections later oiled had been resurfaced. The average elapsed period between the time of the original surfacing and the resurfacing was five years. For comparison, by the end of 1928 a total of 354.3 miles of the sections that eventually received oil-surface treatment had been resurfaced at an average cost of $4,446 per mile.

The traffic increased approximately 100 per cent between 1923 and 1928, so that if the sections had not been surface-treated with oil, the wear would undoubtedly have been much greater. To be conservative, however, the average cost of resurfacing all sections in the state at the

end of 1928 ($4,300 per mile) will be used as the average charge for resurfacing. This will amount to $860 per mile per year for replacement of worn-out macadam materials on untreated macadam surfacing, which equals a wear of approximately three-fourth inches of loose macadam per year. The average summer traffic was approximately 500 vehicles per day.

Tables that further illustrate this comparison follow:

YEARLY MILEAGES OF MAINTENANCE ON 1069 MILES OF HIGHWAY USED IN ACCOMPANYING COST COMPARISON

Year	Miles Under Maintenance		
	Unoiled Mac.	Oiled Mac.	Total
1920	22	------	22
1921	191	------	191
1922	420	------	420
1923	639	8	647
1924	797	44	841
1925	849	151	1,000
1926	724	403	1,127
1927	404	766	1,170
1928	127	1,069	1,196
Totals	4,173	2,441	6,614

This table does not include those untreated macadam surfaces which are not oiled at the present time.

COMPARISON OF THE COST OF THE MAINTENANCE OF 1069 MILES OF MACADAM BEFORE AND AFTER OIL-SURFACE TREATMENT

COSTS PER MILE PER YEAR

Item	Unit Cost Per Mile Per Year	
	Oiled Macadam	Unoiled Macadam
Original Oiling	$ 439.00	$ ------
Reoiling	379.00	------
Maintenance Oiled Surface	368.00	------
Maintenance Un-oiled Surface	------	510.00
Resurfacing	------	860.00
Totals	$1,186.00	$1,370.00

Difference or saving equals $184 per mile per year, which is approximately 13 per cent.

The costs shown in the cost comparison table include, in all cases, the cost of the rock or gravel used. The maintenance of the unoiled surface also includes the cost of replacing the filler which had blown away. The costs as shown were obtained from the records except in certain cases in the earlier years where assumptions as to the exact amount of rock used were necessary. The resurfacing charge as above explained was estimated on the basis of past experience.

The cost of $439 per mile per year does not indicate that this is the cost per mile for the original oiling, but it is the cost per mile per year since the original oiling has lasted several years. In like manner the cost of reoiling is a per-mile-per-year charge. It has not been necessary to reoil every year. The other costs have been considered hereinbefore.

The average cost of the original oil-surface treatment to date has been $766 per mile without screenings, and $896 per mile with screenings, including both the light oil and the heavy oil specification. The average cost of the reoiling treatments to date has been $589 per mile without rock, and $763 per mile with rock or gravel screenings. Many miles of light-oil treatment were reoiled with a heavy oil specification, which will last a longer period.

Such failures of oiled macadam surfacing as developed were due largely to poor foundations and lack of drainage, which features are being given more attention on our later work. The first macadams built were not designed for the character and density of traffic that has developed. The foundations on new work are in general at least 12 inches in thickness, and the roadbed sections are wider, permitting deeper ditches.

BITUMINOUS PAVING REPAIR WORK

When asphaltic concrete pavements become rough and deteriorate to the extent that they cannot be successfully maintained by the patrol gangs, the repairs necessary to put them in good condition are made by means of portable paving repair plants operated by special paving repair crews. By these plants and their auxiliary equipment, all spots of broken pavement are repaired, settlements and depressions caused by heavy truck traffic are built-up, and all "wrinkles" and other irregularities are removed. Ordinarily the repairs made by the repair plants leave the pavements fully as strong and otherwise in as good condition as they were at the time of original construction.

The large portable pavement repair plants Nos. 3 and 4 are in units mounted on trailers. One trailer carries the dryer and mixer, one the 30-barrel kettle and one the boiler. The tool house is also mounted on a trailer, and the gas service unit on a semi-trailer. In addition to the above equipment, each plant includes one roller, two street kettles, one tool heater, two surface heaters, five hauling trucks, one service truck, one oil trailer, one oil tank truck, one water trailer, one flat bottom trailer for the roller and two Ford cars.

Some changes were made in the work of the bituminous paving plants during the past biennium, in that their scope was extended to include the major patching of oiled macadams and the construction, on an experimental basis, of plant-mixed bituminous macadams. In both of these operations 95 per cent asphaltic oil was used as the binder rather than 50-60 penetration asphalt. It was not necessary to heat the aggregate to the extent that is practiced in asphaltic concrete mixes, and the increased output materially decreased the cost per ton. A more detailed description of plant-mixed bituminous macadams appears in that section of this report which is devoted to minor betterments.

The larger plants, Nos. 3 and 4, are rather cumbersome to move around for small scattered patching, and to overcome this difficulty one smaller plant was designed and tried out during 1927. This plant proved so

successful in reducing the cost of light, scattered patching, without impairing the workmanship, that one of the larger plants, No. 3, was held in the Salem shops during 1928, while three smaller plants, Nos. 9, 10 and 13, were employed.

The smaller plants consist of one 7 cubic foot concrete mixer mounted on a trailer and equipped with four aeroil kerosene burners, mounted on a trailer, for use in drying the stone and mixing the mineral aggregate and asphaltic binder, one heating kettle, three hauling trucks, one service truck, one Ford truck, one Ford car, one roller and one water trailer.

During the past biennium the cost of operating the paving repair plants amounted to $276,047.07. This cost included the mixing and placing of 23,993 tons of bituminous materials at an average cost of $11.51 per ton, and the heating and reshaping of 131,585 square yards of pavement at an average cost of $0.21 per square yard. The unit costs and quantities of the work performed by each plant during 1927 and 1928 are as follows:

WORK PERFORMED BY PAVING REPAIR GANGS

Classification	Tons	Cost	Cost Per Ton
Asphaltic Concrete (1927):			
Plant No. 5	2,416.85	$ 32,343.28	$ 13.38
Plant No. 4	6,116.91	74,062.96	12.11
Plant No. 9	692.51	11,114.54	16.05
Plant No. 10	190.27	3,606.01	18.95
Totals	9,416.54	$121,126.79	$ 12.86
Asphaltic Concrete (1928):			
Plant No. 4	7,095.00	$ 85,552.91	$ 11.78
Plant No. 9	1,677.25	25,624.47	15.28
Plant No. 10	341.50	4,718.52	13.82
Totals	9,113.75	$113,895.90	$ 12.49
Bituminous Macadam (1928):			
Plant No. 4	1,000.50	$ 5,736.68	$ 5.73
Plant No. 9	564.00	3,758.07	6.66
Totals	1,564.50	$ 9,496.75	$ 6.07
Oiled Macadam Patching (1928):			
Plant No. 9	1,491.90	$ 10,643.61	$ 7.13
Plant No. 10	1,348.75	11,149.50	8.27
Totals	2,840.65	$ 21,793.11	$ 7.69
Bituminous Macadam Shoulders (1928):			
Plant No. 9	1,057.71	$ 9,636.52	$ 9.11
Totals	1,057.71	$ 9,636.52	$ 9.11

	Sq. Yds.	Cost	Cost Per Sq. Yd.
Heating and Reshaping Bituminous Pavement:			
1927 operations	51,127	$ 10,105.13	$ 0.20
1928 operations	80,462	17,453.13	0.21
Totals	131,589	$ 27,558.26	$ 0.21

SNOW REMOVAL

Snow removal on the streets of cities and on highways through very thickly populated districts has long been considered a necessity, but the demand for clear arteries of traffic through unpopulated districts and mountain sections in order to accommodate the growing traffic between large centers of population is becoming greater each year. The investment in highway construction and highway transport is enormous, and fundamentally it is poor economics to tie up traffic through a long period in the winter through failure to remove the snow. The investment by the public in motor vehicles, including passenger cars and trucks, represents many millions of dollars, the value of which is greatly depreciated unless clear means of communication are maintained throughout the year.

Of course, snow removal must be governed by the volume of traffic which can be expected to use the highways during the winter months and the cost of keeping the road open to such traffic. Each local condition in this respect is a separate problem.

During the past two years, notable advancement has been made in the development of efficient and economical snow fighting equipment all over the United States. The mold-board push plow, mounted in front of fast three-ton pneumatic-tired trucks, still remains the fastest and most economical method of removing light snow. Heavy motor graders of the wheeled type, equipped with pneumatic tires, and with a V-type or small mold-board plow mounted ahead of the front wheels, are also quite efficient, and can be used to remove light snows on those sections where motor graders of this type are assigned for summer maintenance. The big problem in snow fighting still remains the adaptation of the routine equipment to this special service, inasmuch as the cost of providing separate and distinct pieces of equipment for snow removal work throughout the state would be prohibitive.

While it is comparatively easy to adapt summer equipment for removing light snow, this becomes a much more serious problem in connection with the removal of heavy snows in the mountain passes. While a few heavy tractors equipped with push plows are still reserved for emergency work, it has been very well demonstrated that the rotary plow is the proper equipment for heavy snows. The rotary plows are of two general types: the lateral type and the blower type. Both types of various sizes can be mounted on tractors or trucks. It is generally conceded that the blower type is to be preferred to the lateral type in sidehill work, because of the inability of the lateral type to throw the snow far enough up the bank to prevent its return on the roadway. In consequence only one side of the plow functions. The lateral type is, of course, at a still greater disadvantage on a thorough cut where there is a bank on both sides. On the other hand the blower type throws the snow upward, if necessary, at a very acute angle while the velocity carries the snow a much further distance than the lateral type. It is also possible to control the direction of the snow from the chutes on the blower type, which enables the operator to take advantage of the direction of the wind. The blower type also has the advantage of throwing all the snow in one direction, which is of considerable importance in handling traffic during the snow removal operations.

It is the practice in this state to use the truck plows, both of the mold-board push plow and rotary type, for maintenance operations in pref-



LEFT--PARTIALLY CLEARED ROADWAY ON MT. HOOD HIGHWAY FOLLOWING A HEAVY FALL OF SNOW; CENTER—ON THE DALLES-CALIFORNIA HIGHWAY IN KLAMATH COUNTY; RIGHT—SNOW ON THE COLUMBIA RIVER HIGHWAY FOLLOWING UNUSUAL STORM IN 1928

erence to the tractor units on account of the superior mobility of the truck equipment. The rotary plows mounted on tractors are held in reserve to aid in opening blocked highways, either those sections which are blocked by extreme and severe storms, or those sections which are permitted to close during the winter months and are opened for early spring traffic. Both the truck and tractor power units are used for other maintenance purposes during the summer season.

During the season of 1928 the following equipment was employed in snow removal operations:

50 truck mold-board plows
8 motor grader plows
15 5-ton tractor mold-board plows
1 5-ton lateral-type rotary
1 10-ton V-type tractor plow
4 10-ton tractor lateral-type rotary plows
2 lateral-type truck rotary plows
1 blower-type truck rotary plow

Next year the old five-ton tractor units, which will then be worn out, will be retired, while the tractor rotary plow will be mounted on a truck. Two new blower-type truck rotary plows have been purchased for 1928.

In Western Oregon, the only extensive snow removal operations are in the Siskiyou Mountains and on the Mt. Hood Loop from Rhododendron to Swim. The Siskiyou Mountain section is on the main Pacific Highway connecting with California, and it is imperative that a clear artery of traffic be afforded at all times. The equipment in use there consists of two fast mold-board truck plows. In addition a rotary is stationed at Spenser Station on the Klamath Falls-Ashland Highway, which can be used on this section if necessary. Snow is cleared on the west side of the Mt. Hood Loop to permit winter sports near Government Camp. Thousands of people visit these resorts over the week-end and this mountain playground is rapidly becoming as attractive during the winter as the summer. During 1928, a ten-ton tractor rotary plow was stationed at Government Camp for snow removal. In the fall of 1928 a blower-type rotary truck plow was moved to Government Camp for this purpose.

In Central Oregon, all highways are kept open. These include The Dalles-California Highway, Ashland-Klamath Falls Highway, Ochoco Highway, and the Columbia River Highway. Ordinarily the Sun Creek Summit on The Dalles-California Highway has the heaviest snow fall encountered on any of the highways that are kept open all winter. One tractor rotary and one small truck rotary are stationed at Sand Creek to keep this summit clear. At about seven-year intervals, the Columbia River gorge is visited with snow storms of such intensity that the highway is temporarily blockaded. Under such conditions, the wind through the gorge reaches the velocity of a gale and the snow, falling in small, round pellets resembling buckshot or tapioca, rolls down the steep slopes in the gorge and deposits in huge drifts from five to 30 feet deep on the highway and the railroad adjacent thereto. It is impossible to maintain a clear road until the storm, which generally lasts several days, has ceased, and it then requires several days to open the drifts. Such a storm visited this section on New Year's Eve last year and the road was blocked for 16 days.

No attempt was made to keep the Mt. Hood Loop and the McKenzie Pass open through the winter season. Both roads were kept open in the fall as long as the light trucks equipped with mold-board push plows could perform the work. Both roads were opened early in the spring by means of heavy equipment, including rotary plows.

In Eastern Oregon, the major snow condition is through the Blue Mountains, the high pass on the Old Oregon Trail (U. S. Highway No. 30). Two truck mold-board plows and a ten-ton rotary are used to keep this section open. The snow on the John Day Highway is also removed throughout the year. The high passes on this road are at Austin and at the Butte Creek Summit east of Fossil. A rotary plow was stationed at Austin in the fall of 1928.

The total cost of the removal of snow from the state highways during 1927 and 1928 was $273,053.26. Of this amount $135,237.00 was expended during 1927 and $137,816.26 during 1928.

THE USE OF DRAINAGE TUNNELS IN HIGHWAY MAINTENANCE

Slides are of frequent occurrence in the western part of the state of Oregon, especially in the Coast Mountains. The Coast Mountains of Oregon are described by Chester W. Washburn of the United States Geological Survey as an "Irregular group of low and materially dissected hills of tertiary formation rising from the sea, to maximum heights of about 2,500 feet." The main peaks are the remains of intrusive igneous rocks generally diorite, diabase or dolomite. The flanks are covered by sedimentary shales and sandstone cut in places by basaltic dikes. The low, rounded hills are covered by a heavy blanket of soil supporting a heavy growth of trees and brush.

The very heavy rainfall in this region, amounting in places to from 60 to 100 inches per year, causes a super saturation that softens the shale and clay, causing landslides.

In many places the hummocky hillsides with growing trees out of plumb bear mute evidence of old movements. This results in forming pockets, which hold water and, many times, are the cause of further slips.

In certain sections of Coos and Curry counties this condition is further augmented by the action of the ocean on the toes of the slides. Some of these slides cover many acres and are in constant action, generally a slow creep, with an occasional severe slip that moves millions of tons. Many of this type are so severe as to render railroad or highway location impossible. The highway location through this section climbs from the coast back through the hills to circle the heads of such slides.

Under the conditions above outlined, slides are to be expected when railroad or highway grading displaces the surface. They may be grouped in two general classes. In the first class are those slides which occur in cuts and which are mainly caused by changes in the angle of repose of the material. Slight movements under such conditions often develop large cracks which admit water to slipping planes below, causing much larger movements.

In the second class of slides are those slides which occur under embankments. The huge weight of embankments on unstable ground is, in many cases, sufficient to set the slide in motion, especially where the soil is underlaid by impervious stratum, and more particularly when clay is present. Many times the subsidence causes the ground to roll up in front of the toe of the fill. Generally the weight of the fill breaks the small drainage channels which run like veins through the soil. This causes the water, which formerly moved freely through the ground, to impound back of the fill which condition results in a gradual softening of the material of the embankment. The highly saturated material then has a liquid pres-

sure which kicks out the toe of the fill, and sets the slide in motion. Under this condition, the mud slide flows like water on very flat ground, and many times the velocity of the slide will carry the material across a ravine and some distance up the opposite slope. Replacing the fill with earth materials merely results in a repetition of the slide. In the case of small slides it has been found that this condition can many times be cured by installing drains to carry away the water from local springs by surface ditches above the slide or by filling the center of the slide with large boulders, the boulders reaching from the bottom to nearly the top of the fill, thus forming a huge French drain.

In the case of the larger slides, underground drainage tunnels have been found to be the most effective and, in the long run, the most inexpensive means of eliminating this condition. Not much success has been had with retaining walls, piling, or other physical force methods of holding the slides, as the chief cause of these slides appears to be poor drainage. Generally, after a slide has been properly drained, the movement ceases.

In planning drainage tunnels, test borings are taken over the entire area affected, and vertical shafts are sunk at various points to determine the water pockets and slip planes. From these borings, the area is mapped and the tunnel projection is made. Care is taken to locate the tunnel around the slide rather than under it, and to keep the tunnel slightly below the slip plane. The slip plane is generally an impervious stratum covered by clay leached from the material above. Holes are drilled into the roof of the tunnel, and the material loosened by blasting so as to allow the water from the slide proper to escape through the drainage tunnel. Some side tunnels are driven to drain local pockets. The tunnel sets are framed with Port Orford cedar and, while under construction, the tunnels are lighted by electricity and are ventilated by fresh air forced into the headings. Small mine cars are used to remove the spoil.

In some instances, along fault planes, the water collects in a trough formed by the fault where the stratum of the slip plane has a pronounced dip. In this case, it is necessary to place the tunnel in the impervious stratum immediately under the trough, and to drive T-tunnels at the head of the trough so that the water can be cut off above the slide.

The highway department is indebted to Mr. Fred Feikert, assistant engineer of the S. P. Company, Portland, who has had a great deal of experience in drainage tunnel work, for advice given in connection with the first of the tunnels constructed.

STATE PARKS

The state's park site holdings have been greatly augmented, during the biennium, by the acquisition of a large number of desirable areas. Some of these have been acquired by gift of public-spirited citizens, others by purchase and in a few instances acquisition was only secured by exercise of the right of eminent domain. Advantage has also been taken of the Federal Recreation Act which provides a way for the acquisition of Government owned lands for recreational purposes. Negotiations are now pending whereby several large areas will eventually be secured for the State, the same having already been withdrawn from entry by the Secretary of the Interior. The principal tracts being acquired under the provision of this Act are Humbug Mountain Park, containing 290 acres

near the Roosevelt Coast Highway in Curry County; Camas Mountain Park, a tract of 160 acres on the Coos Bay-Roseburg Highway in Douglas County; three tracts in Baker County—one on the Old Oregon Trail at Rattlesnake Springs containing 40 acres, another containing 77 acres adjacent to the Baker-Cornucopia Highway and a 30-acre tract adjacent to the Baker-Unity Highway; a tract containing 40 acres adjacent to The Dalles-California Highway just north of Bend and 40 acres adjacent to the Old Oregon Trail in the Blue Mountain timber reserve in Union County.

Notably among the park areas that have been acquired during the past biennium is "Terrence H. Foley Park" located on the Central Oregon Highway just east of the city of Bend. This site consists of the large cinder cone known as Pilot Butte. It contains approximately 110 acres of land and was presented to the State as a gift by the owners, Charles A. Brown, Kempster B. Miller and Francis R. Weller. It has been named in honor of a former resident of Bend, who died in 1925 and who was deeply interested in the welfare of Central Oregon and who endeared himself to all who knew him. An observation site and space for parking cars has been constructed on the summit and the roadway to the summit has been widened. This park was dedicated to the public with fitting ceremonies on September 30, 1928.

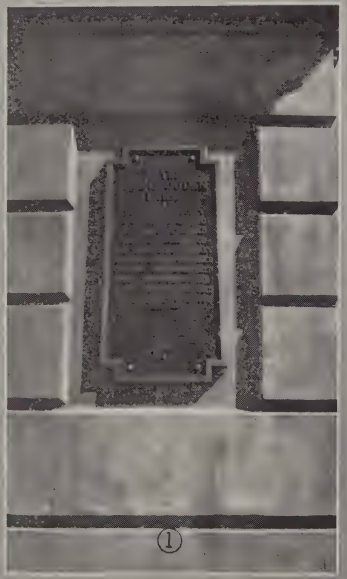
Peter Skene Ogden Park, at the crossing of The Dalles-California Highway over the Crooked River, has been enlarged by the acquisition of 46 acres of land from the United States Government. With this addition, which lies on the south side of the canyon in Deschutes County, the total area of the park is now 103 acres. A parapet wall with observation balconies has been constructed along the edge of the canyon; parking space for cars has been provided and sidewalks connecting with the high bridge have been completed.

The Highway Commission has acquired a number of additional tracts along the Roosevelt Coast Highway in Lincoln County, among which are the sites at Otter Crest, about 10 miles north of Newport, and at Yachats. The Otter Crest site, consisting of 1.48 acres, was purchased from W. S. Badley of Portland for the sum of $500. A wonderful view of the Pacific Ocean and of the rugged coast line may be had from this site. The site at Yachats is also a very scenic spot from which a splendid view of the Pacific Ocean may be secured. This site, which consists of approximately 2.2 acres, was acquired by purchase from the several different owners.

Along the John Day Highway in Baker County, a tract containing 60.27 acres has been purchased from Mr. C. J. Storzback of Salem, for the sum of $180. This tract lies in the canyon of Camp Creek and contains a scattered stand of timber. Good water is available from a spring that rises on the property.

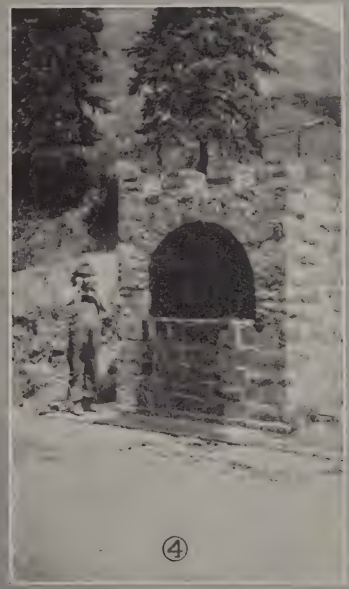
A tract containing 0.79 acre, lying between the John Day Highway and the John Day River at a point about 14 miles north of Dayville, was given to the State by Mr. Charles W. Hoffman of Dayville. A spring, commonly known as Johnny Kirk Spring, rises on the property and furnishes a generous supply of fine water for the traveling public.

On the Columbia River Highway in Hood River County near the Wasco County line, four tracts have been purchased from the Indian owners for the preservation of the timber standing thereon which was being rapidly depleted for cord wood.









1. TABLET AT PORTAL OF CROOKED RIVER BRIDGE IN PETER SKENE OGDEN PARK. 2. SUMMIT OF PILOT BUTTE IN TERRENCE H. FOLEY PARK. 3. LODGE IN EMIGRANT SPRINGS PARK. 4. A ROADSIDE SPRING ON THE LA GRANDE-WALLOWA LAKE HIGHWAY

On the Klamath Falls-Lakeview Highway, about 13 miles west of Lakeview, a 50-acre tract of timber land was given to the State through the generosity of the Oregon Land & Livestock Co. of Eugene. A spring providing good drinking water rises on this property.

In order that the timber standing on the land bordering the Old Oregon Trail over the Blue Mountains in Umatilla and Union Counties might be preserved for coming generations, the State Highway Commission has acquired a large acreage of land in this vicinity. This consists of strips, approximately 500 feet in width, on each side of the highway. Approximately 1,300 acres have been acquired during the biennium for the sum of $17,570 and negotiations are pending for the acquisition of additional land.

Numerous other tracts have been acquired by gift and purchase. A complete list of all of the holdings that have been acquired by the State Highway Commission for the State for park purposes is included in the tabulated statement in Part Four of this report.

ORGANIZATION

On account of the diversified nature of the numerous activities involved in the construction, maintenance and operation of a system of state highways, the work of the Highway Department is best handled by an organization consisting of several sub-departments, each concentrating upon a particular branch of the work and each organized to handle its branch of the work in the most efficient manner. The sub-departments referred to consist of the General Office, the Auditing Department, the Legal Department, the Office Engineering Department, the Bridge Department, the Maintenance Department, the Market Road Department, the Materials Department, the Equipment Department and the five division field organizations. The functions of these sub-departments are as follows:

General Office:

The General Office comprises the office of the State Highway Engineer and the office of the Chief Clerk. Through it are handled all dealings with the public, and from it are directed the operations of all of the other sub-departments. The functions of this office are largely executive in nature, but they include, also, such routine duties as are involved in the centralizing and coordinating of the business of the entire department, such duties, for instance as the distributing of the incoming mail, the collecting and combining of the outgoing mail, express, telegrams, etc., the filing of correspondence, the filing of the original copies of contracts and agreements, the recording and filing of the minutes of the Highway Commission meetings, the interviewing of applicants for employment, and numerous duties of like nature. This office also attends to the issuance of permits for log hauling upon state highways, and permits for the occupancy of state highway rights-of-way by telephone, telegraph and power lines, and by gas and water pipe lines. The chief clerk in the General Office is H. B. Glaisyer.

Auditing Department:

This department receives all bills against the Commission, checks them for correctness of quantities, prices and amounts, attends to the securing of the necessary department approvals thereon, and then draws vouchers authorizing payment of the amounts due. The signatures of the State Highway Engineer and of the State Highway Commissioners are secured on the vouchers, which are then submitted to the Secretary of State's office for final audit and payment. The Auditing Department also handles the payments on monthly estimates to contractors, and draws checks on the $75,000 highway revolving fund for the payment of payroll and emergency items.

All freight traffic and transportation matters are handled by the traffic clerk who is also connected with the Auditing Department, and who checks all freight charges either as direct charges or in connection with reimbursement to contractors and supply houses. The traffic clerk is also the bookkeeper for the Commission, and receives and deposits all receipts, keeping also the revolving fund bank record.

During the biennium, a total of 24,361 state vouchers and 192 county vouchers were issued; many of the vouchers covering from two to fifteen or twenty invoices. For the same period a total of 48,285 bank checks were drawn on the revolving fund. Carl F. Smith has served as auditor during the biennium. R. V. Hollenberg has served as traffic clerk and bookkeeper.

Legal Department:

The duties of the Legal Department consist of the procurement of rights-of-way, gravel pits and rock quarries required for the construction of highways when counties fail to procure same; the preparation of special contracts and agreements; the settlement of disputes and claims for damages; the defense of the Highway Commission in cases of litigation; and other duties of like nature.

This department is headed by J. M. Devers, attorney for the State Highway Commission. Mr. Devers is assisted by Roy C. Harding and J. W. DeSouza.

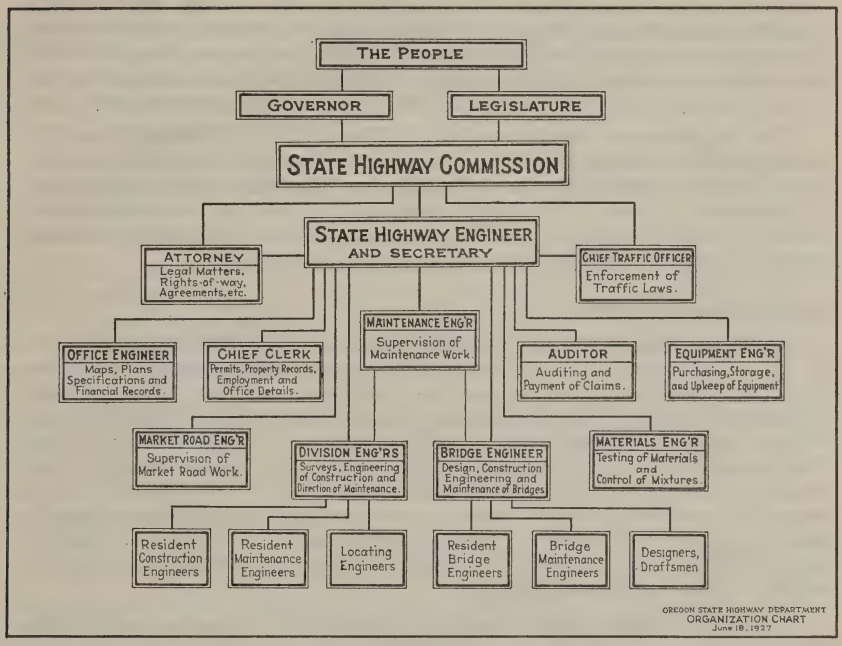
Office Engineering Department:

In the Office Engineering Department are handled those office details of an engineering nature which pertain to surveys, grading, rock and gravel surfacing, and paving. The more important of the duties of this office are the working up of plans and specifications for projects to be contracted; the checking of monthly and final estimates upon which payments under contracts are based; the handling of details in connection with federal cooperation on post road projects; the filing of engineering records; the keeping of the cost and expenditure segregation records; and the compilation of reports, statistics and other data.

Working in conjunction with, and as a part of the Office Engineering Department, is the drafting office, the blue-printing room and the cost-keeping office. In the drafting room the necessary maps, profiles and other drawings are prepared from data obtained by the field forces. In the blue-printing room are prepared the blue prints that are required in connection with the advertising for bids and for the direction of con-

tractors and field employes. In the cost-keeping office is kept a complete and detailed segregation of all expenditures made under the supervision of the Highway Commission.

The work of the Office Engineering Department is in charge of S. H. Probert, office engineer, with L. E. Parsons and J. W. Nash as assistants, E. A. Skelley as chief draftsman, J. W. McCallister as engineer in charge of final estimate checking, and C. T. Hoover as cost accountant.



Bridge Department:

The Bridge Department handles all matters pertaining to bridges and similar structures. By this department the designs, plans and specifications for bridges are prepared; the bridge construction work supervised; the monthly and final estimates checked; and all other work pertaining to bridges taken care of.

This department consists of a general bridge office, a drafting office, and a staff of field engineers and assistants. The work of the department during the past biennium is fully outlined in a preceding article devoted to "Bridges."

The Bridge Department is in charge of C. B. McCullough, bridge engineer, assisted by G. S. Paxson, assistant bridge engineer, O. A. Chase, chief designer, and W. A. Reeves, office engineer.

Maintenance Department:

The function of the Maintenance Department is to supervise and coordinate the handling of highway maintenance operations in the several divisions into which the State is divided for the handling of construction and maintenance work. The immediate direction of maintenance operations is handled by the divison organzations hereinafter described, but the allotment of maintenance funds, the allotment of equipment and all matters involved in the coordinating and standardizing of the many details involved in the maintenance work, are controlled by the Maintenance Department. Among the more important of the details referred to, is the organization and direction of the road-oiling crews and the pavement repair crews, which crews are moved from one division to another at frequent intervals and must, therefore, be controlled by a central authority.

The Maintenance Department is in charge of R. H. Baldock, maintenance engineer, assisted by E. L. Hansen, field man in charge of paving-repair plants; Watson Townsend, office assistant and W. H. Ney, clerk. A discussion of some of the more important features of the maintenance work performed during the past two years and of the expenditures in connection therewith appears in another part of this report.

Market Road Department:

By the Market Road Department are handled all of the details involved in the performance of those duties which are conferred upon the State Highway Commission by the so-called Market Road Act. These duties involve the apportionment of the State Market Road funds to the counties; the making of such investigations as are necessary to enable the Highway Commission to pass intelligently upon the plans for proposed market road work as submitted by the counties; the conferring with county officials in regard to market road work and the problems which arise from time to time in connection therewith, and the rendering to the counties of whatever assistance can be given to insure an economical and practical application of the market road funds.

The Market Road Department is in charge of J. H. Scott, market road engineer, who is assisted in the field by E. A. Collier and in the office by I. A. DeFrance.

Materials Department:

The Materials Department has charge of the acceptance and use of all materials used in the construction and maintenance of highways and bridges, and of such laboratory and field tests and examinations as are necessary to control those features of highway work which involve chemical or mechanical combinations.

For the testing of materials and mixtures, a small but well-equipped laboratory is maintained at Salem. All materials proposed for use are tested according to standard methods and passed upon by the Engineer of Materials. Results of bituminous and Portland cement mixtures are checked by testing daily samples from the field, and a complete record of tests is kept for each project.

Special tests and investigations are conducted by the laboratory in order to determine what type of materials or mixtures is best suited for specific conditions.

In addition to doing the testing work in connection with state highway work and the highways and market road work, many tests of materials are made for other departments of the state, the United States Bureau of Public Roads, county road department and municipalities. A marked increase in the number of samples tested and more complete analyses of materials has caused a marked increase in the activity of the department. Much laboratory work has been involved in connection with the state's oiling program.

During the construction season, an inspector is kept in Portland to sample all cars of road oil before shipment. An inspector is also kept at each of the three Oregon cement plants when substantial amounts of cement are being used on state construction. A sufficient supply of state-tested cement is kept on hand at each of the cement plants at all times to meet the needs of state work.

The Materials Department is in charge of N. M. Finkbiner, Engineer of Materials, who is assisted by G. N. Kelso, assistant and chemist.

Equipment Department:

The Equipment Department has charge of the purchase and upkeep of the equipment required to maintain the state highways; it operates the equipment, repair shops and warehouses; it purchases and distributes all engineering and office supplies, repair parts, accessories, et cetera; and it performs other work of an allied nature.

The organization of the Equipment Department and the exact nature of the functions which it performs are described in detail in that one of the following articles which is headed "Equipment Department." The department is in charge of L. P. Campbell, equipment engineer.

Divisional Field Organizations:

In the performance of the field duties incidental to the supervision and direction of the construction, maintenance and operation of state highways, the State Highway Engineer is assisted by five Division Engineers, each of whom has charge of the work in one of the five districts or divisions into which the State has been divided for the purpose.

Each Division Engineer supervises and directs all engineering work, construction work and maintenance work upon the state highways within his division, and attends to all other matters having to do with highways in that territory. He acts as the local representative of the State Highway Department in dealings with contractors, with county officials and with the public in general. He collects information for and makes recommendations to the State Highway Engineer in those matters calling for field information and intimate knowledge of local conditions.

Two of the Division Engineers have headquarters at Salem and have office space in the general offices of the Department. The other three make their headquarters at points within their divisions, each maintaining a small office through which to handle correspondence and in which to keep such plans and records as are needed in connection with work under way. These outside division headquarters are located at Grants Pass, Bend and La Grande.

In the supervision of construction and maintenance work, the Division Engineer is assisted by Resident Engineers, each of whom has direct

supervision over one or more projects and/or the superintendence of the maintenance of the highways within certain territory. When highway location surveys are to be made in any division, a Locating Engineer is assigned to the division to perform that work under the supervision of the Division Engineer.

The duties of the Resident Engineer, when in charge of construction work, are to work out the details of the construction plans, adjusting them in the interest of economy, and altering them to suit conditions encountered; to set stakes for the guidance of the workmen; to inspect workmanship and materials; to insure compliance with specifications; to measure the quantities of work for which the contractor is entitled to payment, and to otherwise look after and protect the interests of the State in all matters connected with work concerned.

The duties of Resident Engineers who are in charge of maintenance work are to direct the maintenance patrolmen and maintenance crews in the performance of their work; to see that proper materials and equipment are supplied; to keep account of expense incurred, and to, in all respects, look after the upkeep of the highways within their respective territories.

Division No. 1, in charge of Division Engineer W. D. Clarke, with headquarters at Salem, comprises the counties of Clatsop, Columbia, Clackamas, Washington, Yamhill and Tillamook, and the northern parts of Lincoln, Polk and Marion Counties.

Division No. 2, in charge of Division Engineer J. S. Sawyer, with headquarters at Salem, comprises the southern parts of Marion, Polk and Lincoln Counties, all of Linn, Benton and Lane Counties and the northern part of Douglas County.

Division No. 3, in charge of Division Engineer W. E. Chandler, with headquarters at Grants Pass, comprises the southern part of Douglas County, all of Coos, Curry, Josephine and Jackson Counties and most of Klamath County.

Division No. 4, in charge of Division Engineer C. W. Wanzer, with headquarters at Bend, comprises the counties of Hood River, Wasco, Sherman, Gilliam, Jefferson, Deschutes, Crook, Wheeler and Lake, the western parts of Grant and Harney Counties and the northern part of Klamath County.

Division No. 5, in charge of Division Engineer H. G. Smith, with headquarters at La Grande, comprises the counties of Morrow, Umatilla, Wallowa, Union, Baker and Malheur, and the eastern parts of Grant and Harney Counties.

EQUIPMENT DEPARTMENT

The Equipment Department is that subdivision of the Highway Department that has charge of (a) the purchasing and assignment of equipment, (b) the operation of shops for maintenance and repair of equipment, (c) the purchasing of materials and supplies, (d) the warehousing and distribution of material and supplies, and (e) the necessary accounting relating thereto.

The operation of this department is directed from the Headquarters Plant at Salem, where is located the office of the Equipment Engineer and his administrative staff, with branch plants at La Grande, Coquille and Klamath Falls. The Headquarters Plant at Salem is located on approximately 10 acres of State property east of the east city limits of Salem

and south of what would be State Street if extended. The branch plant at La Grande is located on approximately 4.8 acres of State property just inside of the east city limits of La Grande and between Adams Avenue and the Union Pacific Right-of-Way. This site was acquired thru the cooperation of the City of La Grande within the past year. The deed was passed the 18th of January, 1928; the contract for the buildings, which includes a building for the Division Engineer's office, was let the 27th of March, and possession of the buildings was taken in November. The branch plant at Coquille is located on 1.77 acres of State property within the City of Coquille near the Roosevelt Coast Highway bridge across the Coquille River. The branch plant at Klamath Falls is located on 3.23 acres of State property approximately two miles east of the center of the City of Klamath Falls, and 500 feet south of The Dalles-California Highway.

The activities of the Equipment Department as given in the first paragraph are natural subdivisions of the work performed and are used on that account in the set-up of the operating organization. Each activity is in charge of a competent head who is responsible to the Equipment Engineer for the organization and operation of his division. The details of the organization set-up are as follows:

(a) Purchases of equipment are handled by the Equipment Engineer through the Board of Control, subject to the authorization and approval of the Highway Commission. Assignment of equipment is handled directly by the Equipment Engineer.

(b) The operation of shops is handled by the Master Mechanic who is second in authority to the Equipment Engineer. This division embraces direct supervision of the Headquarters Plant and the standardization of operations of the branch plants. The branch plants are in charge of Shop Superintendents who are responsible for the branch organization and who have limited authority pertaining to local assignments of equipment and emergency purchases.

(c) Purchases of materials and supplies are made by the Purchasing Agent for the Highway Department under the following regulations, (1) for certain staple materials such as asphalt, road oils, lubricating oils, gasoline and tires, in conformity with yearly contracts authorized by the Board of Control, and (2) for specialized and emergency materials and supplies under authority delegated by the Board of Control, and for which the Equipment Engineer is deputized as Assistant State Purchasing Agent.

(d) Warehousing and distribution of materials and supplies are handled by the Storekeeper at the Headquarters Plant and by the Shop Superintendents at the branch plants.

(e) The accounting and keeping of records for the Department are handled in the general office at Headquarters under the supervision of the Chief Clerk. A system of reports and records has been set up that centralizes the clerical force in the Headquarters office, with the exception of such clerks as are necessary to make original records at branch plants.

At the time of writing this report of personnel of the Equipment Engineer's administrative staff is as follows: Emil F. Halik, Master Mechanic; Samuel B. Gillette, Purchasing Agent; Clifton B. Mudd, Storekeeper; Emma A. Hinz, Chief Clerk; Hiram T. Smith, Superintendent, La Grande branch; Alpha B. McLeod, Superintendent, Coquille branch; Norval H. Jones, Superintendent, Klamath Falls branch.

In the scheme of the organization of the Highway Department it is presumed that the Equipment Department is the holding department for the entire organization for equipment, materials and supplies that must be purchased and used over various periods of time. Consequently it follows that the Equipment Department must keep its own set of accounts, and set up a system whereby proper charges can be made to the departments and activities served, sufficient to retire the capital investment and cover the maintenance and/or handling of any item during the period of its usefulness. In particular, charges for the use of maintenance and construction equipment are made according to a published "Rental Schedule" which is designed to cover during the useful life of any particular piece of equipment, the first cost and the maintenance, handling and administration costs. The "Rental Schedule" only covers the larger pieces of equipment that will be used over a period of years, small pieces of equipment, tools and supplies are charged direct to the job and are furnished only on requisition properly countersigned by a responsible department head.

Since the last report a considerable number of trucks and other equipment originally allotted to the State by the Government as surplus war material have become unserviceable and have been junked, sold, or otherwise disposed of. It will be noted in the financial statement, elsewhere in this report, that considerable money was expended for new construction and maintenance equipment during this biennium, and it should be borne in mind that most of this new equipment was for replacement of Government equipment taken out of service during that time. Undoubtedly more of this Government equipment will be retired in the coming two years than has been retired in the past two years, and the problem of this department is to study the equipment on the market available for its use and to determine that which is the most adaptable within a reasonable price class.

Considerable study has been given to equipment to be used in snow removal. Note was made in the previous report of the purchase of lateral type rotary plows to be operated with tractors and trucks. Since that report we have purchased two additional plows of this type. We have also purchased a truck mounted snow removal machine of the rotary blower type which has performed very satisfactorily and efficiently. The principal advantage of this machine is that the direction of discharge of the blower can be regulated and the snow thrown to either side of the road as desired. Our experience in the last two years with rotary plows leads us to believe that the truck outfits are more practical than tractor outfits for snow maintenance, because of their increased mobility; however, we must of necessity keep on hand certain tractor outfits as standbys for especially heavy-duty work occasioned by snow slides or unusually severe storms. We have also added to our light truck plow equipment which we find is the backbone of our snow removal program. These truck plows, which are known as the moldboard type, are attached to the regular patrol trucks and handle all the light snowfalls that come from time to time in the snow sections, making it unnecessary to move out the heavy equipment after every fall of snow. When the snow that these light plows move from the roadway to the side becomes of objectionable height the rotary plows are then put in service and cast the snow, so piled up on the edge, over the right-of-way so that there are no banks that will cause drifting during future storms.



VIEWS OF THE EQUIPMENT WAREHOUSES AND SHOPS ERECTED AT LA GRANDE DURING 1928

In addition to the purchase of new equipment to replace obsolete Government equipment and to meet the needs of a growing highway system, the Equipment Department has developed three pieces of equipment that are worthy of special note. Two of these are in connection with the application of heavy road oil and the third is a road magnet for removing tramp iron from the highways. The two types of equipment for road oiling are (1) the oil heaters or "retorts" as they are called, and (2) the new truck oil distributors known as the "C Type Oilers." The retorts are the most successful portable oil heating device that has come to the notice of this department. The oilers are especially designed to meet the requirements of the Highway Department's method of oil surfacing roads and we believe do the work better than any other oiler that we know of. Both the Highway Department's method of applying oil and the equipment used has been copied in neighboring states. The road magnet was built as an attempt to decrease the puncture evil that has been growing in importance quite rapidly the last few years. The outfit is mounted on a light one-ton truck and is operated by two men. It was operated 120 working days the past summer, traveling a distance of 9,874 miles over the highway system during that time. A total of 4,733 pounds of puncture-causing material was collected this year, an average of approximately one and one-half pounds for each mile of improved highway in the state of Oregon. We consider the operation as having been very successful and a great boon to traveling motorists.

The construction activities of this department noted in previous reports were discontinued in the Spring of 1927 when they were turned over to the then newly organized Maintenance Department.

Elsewhere in this report will be found (a) a financial statement of this department, (b) a continuing statement showing the net expenditures through the Equipment Department since its organization, (c) a recapitulation of the last inventory, and (d) a statement showing receipts and disposition of equipment during the past biennium. These tabulations, with the written text, constitute a history of the Equipment Department for the biennium just passed.

Lewis P. Campbell, Equipment Engineer, has been in charge of the operation of the Equipment Department since the first of April, 1922.

LEGAL DEPARTMENT

The activities of the Legal Department during the past two years, while constantly expanding in scope and increasing in diversity, have not been appreciably different than the work handled during the previous years. The legal services rendered have been such as would necessarily be involved in a department rendering legal services to a commission engaged in the multifarious activities involved in the construction, improvement, maintenance and betterment of the Oregon State Highway System.

Although there has been some considerable amount of litigation during the past two years, no great part of this litigation has been of a nature which would endanger the carrying on of the Highway Commission's work, although some few cases of this nature, which will be mentioned later, have arisen. The major portion of the litigation involved has been incidental to the securing of rights-of-way for highways, the securing of

properties, or leases, for sites from which to take materials for construction and maintenance purposes, and the securing of lands for timber preservation and for public parks along the state highways.

During the biennium just closed, this department has assisted in the preparation of and has passed upon 103 contracts covering state highway construction. In addition to these contracts the department has prepared and passed upon 16 miscellaneous contracts, 124 leases and 203 deeds.

The legislature in 1925 passed a law authorizing the Highway Commission to secure lands for the culture of trees and the preservation of scenic places along the state highways, and to secure property for parks, parking places, camp sites, public squares and recreation grounds. While the carrying on of this work has occasioned little or no litigation, the department has been able to assist materially in the securing of the necessary properties.

In addition to the foregoing, the Legal Department has appeared before the Public Service Commission in connection with 15 applications involving railroad and highway crossings. Of this number six applications were made by the State Highway Commission.

Another matter which is of very far-reaching importance to the people of the state and which has involved considerable work by the Legal Department is the question of the removal of tolls upon the interstate bridge between Portland and Vancouver. At the date of the closing of this report, November 30, negotiations have reached the stage where it seems possible to forecast that the collection of tolls on almost all the traffic using the bridge will be discontinued on January 1, 1929. However, at this time there remain several matters to be adjusted and several agreements to be entered into, all of which must be done before the tolls finally are removed.

The work of the department also has involved the legal representation of the State Highway Commission, either as plaintiff or as defendant, in 66 cases instituted in the courts of the state. Not all of these cases have yet gone to final adjudication and several are pending at the present time. There are some of these cases which deserve special mention, and a short resume of a few of the more important will be given. In view of the scope of this article these discussions necessarily must be very brief and it is possible to mention but a few of the out-standing cases.

The case of R. B. Morris et al. vs. the Highway Commission is mentioned in the last biennial report, and was a case which involved the right of the Highway Commission to place load limits upon the traffic using state highways. As stated in the last report, the Supreme Court of the United States dismissed the case on appeal, upon the ground that the question had become moot. As also stated, the Highway Commission had consented to a vacation of this decree and had joined in a request that the United States Supreme Court pass upon the case on its merits. The question on the merits was presented to the Supreme Court upon briefs, and on April 18, 1927, an opinion was handed down sustaining the authority of the Highway Commission in all respects and broadly defining the police powers of the Commission and of the State in controlling traffic using the highways of the State.

In the last report, mention also was made of the case of Anthony et al. vs. Sam A. Kozer, Secretary of State, and Martine et al. vs. Sam A. Kozer,

Secretary of State. The first case challenged the authority of the State of Oregon to collect fees under the Oregon motor vehicle license law, the claim being made that this was a toll, and, therefore, the law was in conflict with the provisions of the Federal Aid Act, which provide that state highways receiving federal aid shall be free from tolls of all kinds. The second case challenged the constitutionality of the gasoline tax statutes, the same claims being made in regard to the gasoline tax as were made with reference to the motor vehicle tax. Both of these cases have since been decided by the United States Supreme Court, and the decision in each case was adverse to the plaintiffs. The cases were first heard by the District Federal Court sitting in Portland, and the decision in each case upheld the constitutionality of the statutes involved. The United States Supreme Court then refused to consider the cases upon appeal. This refusal was based upon the fact that the cases in the District Court had not been heard by three judges and that under the federal statutes no appeal would lay direct to the Supreme Court.

The case of Hamaker vs. Klamath County and State Highway Commission was an action which sought to challenge the authority of the State Highway Commission to locate and improve a section on the Klamath Falls-Lakeview highway. The complaint was dismissed as to the Highway Commission by the trial court, the court holding that the question of the location and improvement of the state highway system was one which had been entrusted by the legislature to the judgment of the State Highway Commission.

Another case of interest is that of the United Contracting Company et al. vs. the State Highway Commission. This litigation arose over one of the contracts awarded by the Highway Commission and involves the question of the right of a private citizen or corporation to sue the State of Oregon without the consent of the State. In the Circuit Court the question was decided adversely to the State, and it is possible that before the end of the litigation is reached the matter will be submitted to the Supreme Court of Oregon for final determination.

Also another case which deserves mention is that of Guy C. H. Corliss, administrator, vs. H. B. Van Duzer. The purpose of this particular suit is to recover damages from Mr. Van Duzer personally and not in his official capacity of State Highway Commissioner. The administrator seeks to recover damages for the estate of Albert D. Jones, arising out of an accident occuring upon the state highway, in which Mr. Jones was killed. In the trial court, the objection was raised by the defendant that the facts stated in the complaint were not sufficient to constitute a cause of action. The trial court decided in favor of Mr. Van Duzer on this question and the case is now pending in the State Supreme Court on appeal.

The work in the Legal Department has been handled by J. M. Devers, Attorney for the Highway Commission, assisted by Roy C. Harding, and since June 20, 1928, by J. W. DeSouza.

STATE TRAFFIC DIVISION

Certain changes have been inaugurated in the State Traffic Division during the past two years. The Legislative Assembly of 1927 provided for the appointment of two captains and three lieutenants to assist the Chief in a supervisory capacity. In addition to this commissioned personnel, the Division has maintained an average strength of 30 officers.

Their activities are summarized briefly and included in tabular form hereinafter. A survey reveals a marked increase over any previous biennium. This may be attributed to the number of men employed, the steady advances that have been made by the public in the use of motor vehicle transportation, and the greater mileage now covered by our highway system.

A total of 1,896,168 miles have been patrolled by the officers of the Division during the two-year period under consideration. This represents an average daily patrol of practically 2,600 miles for 24 months, regardless of weather conditions or other obstacles that tend to diminish the aggregate. A further analysis shows that for every 250 miles of patrol one arrest was made and 18 warnings issued, a written warning every 14 miles. For every offender that has been summoned to appear in court 18 others have been cautioned and instructed to proceed more carefully.

All the duties of a state traffic officer can not be recorded numerically. A recent innovation in the Department has brought about a study of first-aid work so that each officer is now qualified to administer first-aid to the injured and carries a complete kit for emergency work as part of his equipment.

In several localities in the state a system of student traffic control by the students has been encouraged and developed to a point where the movement has been recognized by the school authorities as exceedingly beneficial in the safeguarding of school children. In congested areas, particularly where schools are located adjacent to a main highway or heavily traveled city street, proper protection and the education of the child to respect the rights of motor traffic is no small problem. The State Traffic Division has assisted and at all times encourages such safety campaigns.

The unusual demands upon the traffic organization for service along the line of caravan supervision, the need of protection from destruction of the great highway system by excessive load weights has increased to a degree in excess of what might be considered as a normal increase. A growing industrial condition, with the manufacture of lumber and its allied industries leading all others, has brought about a very material increase in freight shipments over our public highways. This requires constant supervision both day and night. The Division's activities in connection wth this problem totals 6,190 for the biennium. A multiplicity of increased activities are of record but space will not permit a detailed report. Such data, however, is available in the regular annual reports of the traffic division.

It is only logical to assume that plans for betterment and increased efficiency are constantly before us for consideration. During the latter part of this biennium, plans have been worked out and will be actually in effect during the present calendar year for night patrol in certain

important traffic districts, thus assuring a greater degree of safety to the traveling public. Special crews devoting practically all their time to commercial truck traffic will operate in such sections of the state as this problem may effect the physical condition of the highway. This particular activity will without doubt prove of incalculable value. The traffic organization is more complete than ever and naturally greater efficiency must be the result. Reference to the schedule of major activities set out here when compared to the last biennial report will indeed be illuminating and reflect future results in no small degree.

SCHEDULE OF MAJOR ACTIVITIES OF STATE TRAFFIC FORCE

December 1, 1926, to November 30, 1928

Month	Miles Patrolled	Arrests	Warnings	No. of stolen cars found	Value of stolen vehicles Recovered	Fines Imposed	Fees Collected
1926							
December ..	60,370	143	2,384	19	$ 7,465.00	$ 5,671.75	$ 839.45
1927							
January	57,068	126	3,093	18	9,400.00	2,195.90	3,466.00
February	53,165	183	2,072	18	19,675.00	3,383.75	5,236.10
March	62,660	164	2,196	12	6,325.00	3,364.00	6,018.25
April	77,392	248	4,548	20	11,215.00	4,070.85	7,081.50
May	96,913	255	4,870	14	8,155.00	5,325.80	6,464.25
June	86,702	234	4,683	11	6,410.00	4,100.15	5,113.12
July	99,325	264	5,756	18	6,600.00	4,697.95	5,369.78
August	89,280	235	6,023	14	6,475.00	4,326.45	5,192.87
September ..	82,665	175	3,969	10	2,250.00	3,980.00	4,151.56
October	85,884	146	7,392	19	5,100.00	4,572.40	3,780.24
November ..	73,984	279	5,462	24	12,349.00	2,209.05	5,578.99
December ..	70,427	165	4,117	25	9,325.00	3,102.80	3,573.88
1928							
January	62,730	113	4,837	36	11,900.00	2,042.50	2,472.19
February	65,931	386	4,717	18	7,175.00	2,374.85	8,094.25
March	77,175	216	6,569	13	3,825.00	2,913.05	10,118.61
April	78,513	191	6,898	15	5,600.00	2,583.36	9,392.25
May	89,899	407	8,495	18	8,450.00	3,768.40	10,843.61
June	96,445	497	8,853	17	5,075.00	4,882.45	10,633.85
July	94,212	778	9,090	9	4,200.00	4,789.85	6,627.25
August	93,613	720	9,051	19	8,950.00	3,812.45	4,711.45
September ..	91,658	555	8,357	12	6,600.00	3,669.00	3,751.68
October	78,104	489	6,512	23	10,015.00	5,299.50	3,302.69
November ..	72,053	586	5,302	27	10,150.00	3,697.85	2,028.70
Totals	1,896,168	7,555	135,246	429	$192,684.00	$ 90,834.11	$133,842.52

Fines imposed	$ 90,834.11
Fees collected	133,842.52
Resale value of stolen vehicles recovered	192,684.00
Grand total	$417,360.63



TOP—THE DALLES-CALIFORNIA HIGHWAY IN WASCO COUNTY; CENTER—KLAMATH FALLS-LAKEVIEW HIGHWAY NEAR BEATTY: BOTTOM—UMPQUA HIGHWAY NEAR REEDSPORT

PART THREE

Financial Statements

Covering the Fiscal Period

December 1, 1926, to November 30, 1928

INDEX TO TABLES

Table I. Statement of Receipts and Disbursements Through State Highway Fund.
Table II. Summary of Net Incomes and Net Expenditures.
Table III. Detailed Summary of Net Income.
Table IV. Detailed Summary of Net Expenditures.
Table V. Expenditures for Construction Work Summarized by Counties.
Table VI. Expenditures for Maintenance Work Summarized by Counties.
Table VII. Expenditures for Construction Work Summarized by Highways.
Table VIII. Expenditures for Maintenance Work Summarized by Highways.
Table IX. Detailed Statement of Expenditures for New Construction Work.
Table X. Detailed Statement of Expenditures for Major Additions and Betterments.
Table XI. Detailed Statement of Expenditures for Special Maintenance Work.
Table XII. Detailed Statement of Expenditures in Connection with Federal Forest Road Work.
Table XIII. Expenditures for Minor Betterment Work Summarized by Counties.
Table XIV. Expenditures for General Maintenance Work Summarized by Counties.
Table XV. Expenditures for Additions and Betterments Classified as to Kind of Work.
Table XVI. Expenditures for Maintenance Classified as to Kind of Work.
Table XVII. Expenditures for Operation of Draw Bridges and Ferries.
Table XVIII. Expenditures in Connection with Equipment and Supplies.
Table XIX. Expenditures for Parks and Timber Preservations.
Table XX. Expenditures for Extra Right-of-Way, Quarries and Maintenance Patrol Stations.
Table XXI. Expenditures for Surveys.
Table XXII. Expenditures for Construction Engineering on County Work.
Table XXIII. Expenditures for General and Miscellaneous Purposes.
Table XXIV. Market Road Receipts and Disbursements Summarized by Counties.

TABLE I

STATE HIGHWAY FUND

December 1, 1926, to November 30, 1928

The below statement of receipts and disbursements under the State Highway Fund is arranged with the view of setting out particularly the net receipts and net disbursements of strictly State moneys as differentiated from Federal Government, county and railroad moneys disbursed through the State Highway Fund, and as differentiated from certain other moneys which are handled through the State Highway Fund as a matter of convenience but which do not affect the net income or net expenditure in connection with state highway work. The statement is intended chiefly as a reconciliation of the receipts and disbursements through the State Highway Fund with the receipts and disbursements in connection with state highway work as these are set out in tables which follow.

It should be noted that the receipts and expenditures of the funds of the Federal Government, the counties and other contributors, as shown in this statement, are partial only, being only the portions of such receipts and expenditures that are handled through the State Highway Fund. For complete statements of receipts and expenditures in connection with state highway work see Tables II, III and IV.

RECEIPTS

Net Income Items (state funds only):			
Balance on hand December 1, 1926:			
Cash (including $75,000 in Revolving Fund)	$ 790,912.31		
County warrants	79,495.67		
Total	$ 870,407.98		
Motor Vehicle License Fees	$ 9,546,609.20		
Gasoline and Distillate Tax	7,544,943.62		
Motor Transportation Fees	148,156.56		
Interest on Bank Balances, etc.	65,992.66		
Fines for Traffic Law Violations	42,973.05		
Total Net Income (state funds only)		$18,219,083.07	
Miscellaneous Receipts and Receipts of Cooperative Funds Handled Through the State Highway Fund:			
Federal Aid	$ 1,693,961.84		
County Cooperation	535,090.80		
Cooperation of Miscellaneous Contributors	79,654.24		
Cash Receipts from Sales, Rentals Refunds and Miscellaneous	200,048.84		
Total of miscellaneous receipts and receipts of cooperative funds handled through the State Highway Fund		$ 2,508,755.72	
Grand Total of Receipts in State Highway Fund			$20,727,838.79

DISBURSEMENTS

Net Disbursements (state funds only):			
New Construction		$ 1,899,988.19	
Major Additions and Betterments		422,153.20	
Minor Additions and Betterments		942,903.38	
Special Maintenance		1,588,549.32	
General Maintenance		4,738,762.95	
Operation of Draw Bridges and Ferries		44,217.39	
Cooperation in Forest Road Work		250,943.85	
Rights of Way, Patrol Stations, etc.		121,416.79	
Parks and Timber Preservations		109,183.12	
Enforcement of Traffic Laws		123,300.01	
Interest on Bonds		3,249,276.86	
Maturities on Bonds		3,350,000.00	
Equipment and Supplies:			
Gross Disbursement	$2,825,391.91		
Credit from sales and rentals	2,780,468.73		
Net disbursement		44,923.18	
Administration and General Supervision		409,816.13	
Surveys		117,746.51	
Engineering County Work		1,682.46	
Miscellaneous General Expense		34,861.36	
Total Net Disbursement (state funds only)			$17,449,814.70
Miscellaneous Disbursements and Disbursements of Cooperative Funds Handled Through the State Highway Fund:			
Federal Aid Funds		$ 1,693,961.84	
County Funds		535,090.80	
Funds of Miscellaneous Contributors		79,654.24	
Disbursements offset by credits accrued through sales, rentals, refunds and miscellaneous		200,048.84	
Total of miscellaneous and cooperative funds handled through the State Highway Fund			$ 2,508,755.72
Grand total of Disbursements through the State Highway Fund			$19,958,570.42
Balance on hand December 1, 1928			*$ 769,268.37

* This balance includes $43,500.00 in cooperative county warrants and $664.55 in miscellaneous county warrants. It also includes $75,000.00 in the Revolving Fund.

TABLE II

SUMMARY OF NET INCOMES AND NET EXPENDITURES

December 1, 1926, to November 30, 1928

This table shows the grand totals of net incomes and net expenditures in connection with state highway work handled under the direct control of the State Highway Commission. It includes all county cooperation upon work directed by the Highway Commission, and all federal government cooperation upon federal aid projects. It does not include market road moneys, nor moneys of the Federal Government and counties expended upon forest road projects.

It is to be noted that the amounts shown as "State Funds" correspond, not to the total receipts and disbursements in the State Highway Fund, but to the "Net Receipts" and "Net Disbursements" of the State funds as separately set out in the State Highway Fund statement which immediately precedes this table.

Funds	Net Incomes	Net Expenditures	Balance on Hand Dec. 1, 1928
State Funds	$*18,219,083.07	$ 17,449,814.70	$ 769,268.37
County Funds	1,302,305.17	1,302,305.17	.....
Federal Government Funds	1,693,961.84	1,693,961.84	.....
Funds of Miscellaneous Contributors	85,605.47	85,605.47	.....
Grand Totals	$*21,300,955.55	$ 20,531,687.18	$ 769,268.37

* Includes balance of $870,407.98 carried over from 1926.

For detailed statement of receipts see Table III.
For detailed statement of expenditures see Table IV.

TABLE III

DETAILED SUMMARY OF INCOME

December 1, 1926, to November 30, 1928

STATE FUNDS:		
Balance on hand December 1, 1926	$ 870,407.98	
Motor Vehicle License Fees, 1927	4,620,000.00	
Motor Vehicle License Fees, 1928	4,926,609.20	
Gasoline and Distillate Tax, 1927	† 3,887,655.24	
Gasoline and Distillate Tax, 1928	‡ 3,657,288.38	
Motor Transportation Fees, 1927	49,854.21	
Motor Transportation Fees, 1928	98,302.35	
Interest on Bank Balances, Warrants, etc., 1927	46,053.35	
Interest on Bank Balances, Warrants, etc., 1928	19,939.31	
Fines for Traffic Law Violations, 1927	23,716.20	
Fines for Traffic Law Violations, 1928	19,256.85	
Total Income of State Funds		*$18,219,083.07
COUNTY FUNDS:		
Cash remitted to State in payment of agreed cooperation, 1927	$ 279,292.39	
Cash remitted to State in payment of agreed cooperation, 1928	255,798.41	
Cooperative construction paid for directly by counties, 1927	339,386.83	
Cooperative construction paid for directly by counties, 1928	427,827.54	
Total Income of County Funds		1,302,305.17
FEDERAL GOVERNMENT FUNDS:		
Cash remitted to State in payment of agreed cooperation, 1927	$ 1,111,521.64	
Cash remitted to State in payment of agreed cooperation, 1928	582,440.20	
Total Income of Federal Government Funds		1,693,961.84
FUNDS OF MISCELLANEOUS CONTRIBUTORS:		
Cash remitted to State in payment of agreed cooperation, 1927	$ 52,680.85	
Cash remitted to State in payment of agreed cooperation, 1928	26,973.39	
Cooperative construction paid for directly by contributors, 1927	5,951.23	
Cooperative construction paid for directly by contributors, 1928		
Total Income, Funds of Miscellaneous Contributors		85,605.47
Grand Total Net Income from all Sources		*$21,300,955.55

* Includes balance of $870,407.98 carried over from 1926.

† This amount represents collections during approximately 13 months.

‡ This amount represents collections during approximately 11 months.

TABLE IV

SUMMARY OF EXPENDITURES

December 1, 1926, to November 30, 1928

Classification	Table To Be Referred to for Details	Total Amount Expended	Cooperation in Expenditures				Engineering and Administration (Included in Preceding Columns)
			By State	By Counties	By Federal Government	By Miscellaneous Contributors	
New Construction	IX	$ 4,703,533.81	$ 1,899,988.19	$1,294,805.17	$1,426,210.31	$ 82,530.14	$ 265,970.91
Major Additions and Betterments	X	660,320.71	422,153.20	7,500.00	227,592.18	3,075.33	27,092.68
Special Maintenance	XI	1,628,708.67	1,588,549.32		40,159.35		85,541.54
Cooperation in Forest Road Work	XII	250,943.85	250,943.85				
Minor Additions and Betterments	XIII-XV	942,903.38	942,903.38				
General Maintenance	XIV-XVI	4,738,762.95	4,738,762.95				212,807.18
Rights of Way, Patrol Stations, etc.	XX	121,416.79	121,416.79				4,251.45
Operation of Draw Bridges and Ferries	XVII	44,217.39	44,217.39				
Parks and Timber Preservation	XIX	109,183.12	109,183.12				8,685.17
Enforcement of Traffic Laws	XXIII	123,390.01	123,390.01				
Equipment and Supplies (holding ac't)	XVIII	44,923.18	44,923.18				
Interest on Bonds	XXIII	3,249,276.86	3,249,276.86				
Maturities on Bonds	XXIII	3,350,000.00	3,350,000.00				
Administration and Supervision	XXIII	409,816.13	409,816.13				409,816.13
Surveys	XXI	117,746.51	117,746.51				117,746.51
Engineering County Work	XXII	1,682.46	1,682.46				1,682.46
Miscellaneous General Expense	XXIII	34,861.36	34,861.36				
Totals		$20,531,687.18	$17,449,814.70	$1,302,305.17	$1,693,961.84	$ 85,605.47	$1,133,594.03

TABLE V

EXPENDITURES FOR CONSTRUCTION WORK SUMMARIZED BY COUNTIES

December 1, 1926, to November 30, 1928

The amounts given in this table include such expenditures for new construction work, major and minor betterment work, surveys, and engineering of county work as are directly chargeable to particular counties. They include, also, state expenditures in connection with forest road work. They do not include expenditures for maintenance work or for general purposes such as interest and maturities on bonds and administration and general supervision. For summary of construction expenditures by highways and for other details, see the tables which follow:

County	Total Amount Expended	Cooperation in Expenditures			
		By State	By Counties	By Federal Government	By Miscellaneous Contributors
Baker	$ 301,653.05	$ 98,657.91	$ 150,121.50	$ 24,704.55	$ 28,169.09
Benton	343,469.40	200,229.68	137,268.92		5,970.80
Clackamas	241,547.99	174,156.85	2,255.00	64,946.42	189.72
Clatsop	216,795.82	38,936.88	50,000.01	127,858.93	
Columbia	17,303.84	17,303.84			
Coos	212,857.75	169,261.15	2,500.00	41,096.60	
Crook	2,057.30	2,057.30			
Curry	615,786.59	277,256.03	6,000.00	332,530.56	
Deschutes	89,043.07	55,458.98	9,404.52	24,179.57	
Douglas	487,977.35	163,115.32	168,994.62	155,867.41	
Gilliam	2,646.73	2,646.73			
Grant	16,803.51	16,803.51			
Harney	48,620.16	29,997.95	18,622.21		
Hood River	47,464.15	47,464.15			
Jackson	287,898.79	218,193.85	27,658.25	31,546.69	10,500.00
Jefferson	25,564.12	5,541.94	19,282.18		740.00
Josephine	371,841.33	158,451.40	40,000.00	173,389.93	
Klamath	311,823.89	289,997.53	72,613.23	cr. 50,786.87	
Lake	235,718.68	190,528.27	25,692.32	19,498.09	
Lane	399,010.55	48,799.97	248,876.01	101,334.57	
Lincoln	297,609.15	143,466.15	10,000.00	144,143.00	
Linn	187,976.22	63,942.63	68,431.53	27,948.18	27,653.88
Malheur	154,253.13	70,656.23	22,500.00	61,096.90	
Marion	22,441.48	22,441.48			
Morrow	89,406.22	48,695.03	40,711.19		
Multnomah					
Polk	140,725.38	129,284.58		11,440.80	
Sherman	49,416.21	49,416.21			
Tillamook	733,889.38	417,374.87	77,552.34	238,962.17	
Umatilla	243,321.83	72,500.26	71,160.44	87,279.15	12,381.98
Union	68,865.21	68,865.21			
Wallowa	32,345.51	18,171.86	14,173.65		
Wasco	153,706.43	145,219.18	8,487.25		
Washington	80,940.09	75,940.09	5,000.00		
Wheeler	81,615.86	39,850.02	5,000.00	36,765.84	
Yamhill	64,734.55	64,734.55			
Totals	$ 6,677,130.72	$ 3,635,417.59	$1,302,305.17	$1,653,802.49	$ 85,605.47
Expenditures for Maintenance Work	6,411,689.01	6,371,529.66		40,159.35	
Expenditures for General Purposes	7,442,867.45	7,442,867.45			
Grand Totals	$20,531,687.18	$17,449,814.70	$1,302,305.17	$1,693,961.84	$ 85,605.47

TABLE VI

EXPENDITURES FOR MAINTENANCE WORK SUMMARIZED BY COUNTIES

December 1, 1926, to November 30, 1928

The amounts given in this table include all expenditures for general maintenance, special maintenance and operation and maintenance of draw bridges. For summary of maintenance expenditures by highways and for other detail, see the tables which follow.

County	Expended Dec. 1, 1926, to Nov. 30, 1927	Expended Dec. 1, 1927, to Nov. 30, 1928	Total Expenditure 1927-28 Biennium
Baker	$ 119,682.32	$ 110,963.29	$ 230,645.61
Benton	96,115.45	105,352.56	201,468.01
Clackamas	148,085.80	35,694.52	183,780.32
Clatsop	96,047.81	48,675.03	144,722.84
Columbia	18,493.52	23,161.19	41,654.71
Coos	101,955.62	104,800.88	206,756.50
Crook	24,104.65	20,355.17	44,459.82
Curry	41,030.13	94,281.89	135,312.02
Deschutes	77,248.48	97,690.27	174,938.75
Douglas	133,180.73	114,967.80	248,148.53
Gilliam	104,827.27	128,383.98	233,211.25
Grant	40,829.42	37,252.13	78,081.55
Harney	7,091.21	8,228.00	15,319.21
Hood River	128,803.98	91,049.07	219,853.05
Jackson	161,116.71	126,766.12	287,882.83
Jefferson	59,475.15	69,635.33	129,110.48
Josephine	83,211.39	52,231.78	135,443.17
Klamath	234,873.89	294,286.47	529,160.36
Lake	24,732.43	29,333.25	54,065.68
Lane	104,937.02	131,709.01	236,646.03
Lincoln	109,760.37	101,285.23	211,045.60
Linn	31,891.57	40,906.08	72,797.65
Malheur	109,443.24	46,436.82	155,880.06
Marion	32,400.38	36,881.79	69,282.17
Morrow	68,891.03	145,488.80	214,379.83
Multnomah	304.36	8,413.68	8,718.04
Polk	32,589.26	73,262.20	105,851.46
Sherman	69,242.61	90,205.43	159,448.04
Tillamook	113,759.85	121,169.14	234,928.99
Umatilla (state funds)	123,097.22	310,211.99	433,309.21
(Government funds)	40,159.35		40,159.35
Union	173,716.24	151,517.27	325,233.51
Wallowa	109,026.84	50,835.93	159,862.77
Wasco	104,673.50	154,904.46	259,577.96
Washington	14,812.92	12,477.57	27,290.49
Wheeler	23,831.87	34,155.43	57,987.30
Yamhill	51,790.75	83,188.47	134,979.22
Undistributed expenses	101,347.37	108,949.27	210,296.64
Totals	$ 3,116,581.71	$ 3,295,107.30	$ 6,411,689.01
State expenditures	$ 3,076,422.36	$ 3,295,107.30	$ 6,371,529.66
Government expenditures	40,159.35		40,159.35
Totals	$ 3,116,581.71	$ 3,295,107.30	$ 6,411,689.01

TABLE VII

EXPENDITURES FOR CONSTRUCTION WORK SUMMARIZED BY HIGHWAYS

December 1, 1926, to November 30, 1928

The amounts given in this table include such expenditures for new construction work, major and minor betterment work, surveys and engineering of county work as are directly chargeable to the particular highways. They include also state expenditures in connection with forest highway work. They do not include expenditures for maintenance work or the expenditures of the federal government and counties in connection with forest highway construction work.

Hwy. No.	Highway	Total Amount Expended	Cooperation in Expenditures			
			By State	By County	By Federal Government	By Miscellaneous Contributors
1	Pacific	$ 371,083.91	$ 142,014.92	$ 62,914.48	$ 152,389.46	$ 13,765.05
2	Columbia River	268,099.34	186,362.11	.....	81,737.23	.....
3	West Side Pacific	49,678.17	38,237.37	.....	11,440.80	.....
4	The Dalles-California	140,001.94	132,415.91	33,453.33	Cr. 26,607.30	740.00
5	John Day	175,409.12	67,107.67	22,500.00	85,801.45	.....
6	Old Oregon Trail	123,164.41	23,503.28	.....	87,279.15	12,381.98
7	Central Oregon	125,332.66	102,989.83	22,342.83	.....	.....
8	Oregon-Washington	111,406.33	70,695.14	40,711.19	.....	.....
9	Roosevelt Coast	2,230,023.53	1,027,590.45	243,711.64	958,721.44	.....
10	La Grande-Wallowa Lake	47,516.92	46,398.42	1,118.50	.....	.....
11	Enterprise-Flora	25,313.34	12,258.19	13,055.15	.....	.....
12	Baker-Cornucopia	110,543.61	25,037.77	85,505.84	.....	.....
13	Baker-Unity	123,253.91	58,638.25	64,615.66	.....	.....
14	Prineville-Central Oregon	319.97	319.97	.....	.....	.....
15	McKenzie	129,974.11	11,053.71	45,534.00	73,386.40	.....
16	Santiam	157,444.21	69,665.16	63,200.50	.....	24,578.55
17	McKenzie-Bend	261.28	261.28	.....	.....	.....
18	Willamette	202,910.34	16,183.54	186,726.80	.....	.....
19	Fremont	80,058.10	34,867.69	25,692.32	19,498.09	.....
20	Klamath Falls-Lakeview	390,098.23	317,485.00	72,613.23	.....	.....
21	Ashland-Klamath Falls	18,248.41	18,248.41	.....	.....	.....
22	Crater Lake	184,546.76	184,546.76	.....	.....	.....
23	Dairy-Bonanza	.....	.....	.....	.....	.....
24	Burns-Crane	968.48	968.48	.....	.....	.....
25	Redwood	330,453.79	131,063.86	26,000.00	173,389.93	.....
26	Mt. Hood	118,190.71	118,190.71	.....	.....	.....
27	Alsea	243,034.27	140,705.63	102,328.64	.....	.....
28	Pendleton-John Day	103,577.10	32,416.66	71,160.44	.....	.....
29	Tualatin Valley	1,782.04	1,782.04	.....	.....	.....
30	Salem-Dallas	26,272.47	26,272.47	.....	.....	.....
31	Albany-Corvallis	25,336.79	23,945.91	1,390.88	.....	.....
32	McMinnville-Tillamook	162,668.09	162,668.09	.....	.....	.....
33	Corvallis-Newport	115,236.79	70,716.59	38,549.40	.....	5,970.80
34	Siuslaw	54,723.64	47,043.30	7,680.34	.....	.....
35	Coos Bay Roseburg	85,064.62	82,564.62	2,500.00	.....	.....
36	Pendleton-Cold Springs	1,357.78	1,357.78	.....	.....	.....
37	Umatilla Cut-off	.....	.....	.....	.....	.....
38	Oregon Caves	27,086.26	13,086.26	14,000.00	.....	.....
40	Bertha-Beaverton	76,044.16	71,044.16	5,000.00	.....	.....
41	Ochoco	80,466.04	38,700.20	5,000.00	36,765.84	.....
42	Sherman	2,255.08	2,255.08	.....	.....	.....
43	Monmouth-Independence	968.34	968.34	.....	.....	.....
44	Wapinitia	108,171.36	108,171.36	.....	.....	.....
	Undistributed expense	48,784.31	Cr. 24,384.78	45,000.00	.....	28,169.09
	Totals	$ 6,677,130.72	$ 3,635,417.59	$ 1,302,305.17	$ 1,653,802.49	$ 85,605.47

TABLE VIII

EXPENDITURES FOR MAINTENANCE WORK SUMMARIZED BY HIGHWAYS

December 1, 1926, to November 30, 1928

The amounts given in this table include all expenditures for general maintenance, special maintenance and operation and maintenance of draw bridges.

Hwy. No.	Highway Name	Expended Dec. 1, 1926, to Nov. 30, 1927	Expended Dec. 1, 1927, to Nov. 30, 1928	Total Expenditures 1927-1928 Biennium
1	Pacific	$ 235,145.62	$ 206,649.24	$ 441,794.86
2	Columbia River	230,493.12	340,664.07	571,157.19
3	West Side Pacific	43,420.25	26,861.21	70,281.46
4	The Dalles-California	348,243.10	409,960.99	758,204.09
5	John Day	162,892.51	164,654.56	327,547.07
6	Old Oregon Trail (State funds)	232,173.97	356,850.25	589,024.22
	(Government funds)	40,159.35		40,159.35
7	Central Oregon	6,773.68	6,866.89	13,640.57
8	Oregon-Washington	122,837.34	133,558.33	256,395.67
9	Roosevelt Coast	280,860.99	346,828.68	627,689.67
10	La Grande-Wallowa Lake	204,429.31	91,448.86	295,878.17
11	Enterprise-Flora	9,526.51	8,229.33	17,755.84
12	Baker-Cornucopia	17,383.16	18,963.73	36,346.89
13	Baker-Unity	17,468.45	17,041.80	34,510.25
14	Prineville-Central Oregon	5,331.64	3,952.29	9,283.93
15	McKenzie	34,822.58	85,535.40	120,357.98
16	Santiam	15,030.72	26,809.15	41,839.87
17	McKenzie-Bend	11,440.61	11,832.36	23,272.97
18	Willamette	2,771.21	10,793.51	13,564.72
19	Fremont	21,531.11	22,045.33	43,576.44
20	Klamath Falls-Lakeview	10,904.08	39,541.31	50,445.39
21	Ashland-Klamath Falls	87,723.03	95,422.53	183,145.56
22	Crater Lake	76,435.84	64,478.63	140,914.47
23	Dairy-Bonanza	2,215.97	1,567.77	3,783.74
24	Burns-Crane	4,500.78	5,124.15	9,624.93
25	Redwood	62,078.92	21,917.91	83,996.83
26	Mount Hood	212,548.98	93,828.11	306,377.09
27	Alsea	30,436.35	57,802.02	88,238.37
28	Pendleton-John Day	1,362.82	1,103.33	2,466.15
29	Tualatin Valley	10,948.27	8,668.17	19,616.44
30	Salem-Dallas	5,955.43	10,192.51	16,147.94
31	Albany-Corvallis	4,859.33	1,468.28	6,327.61
32	McMinnville-Tillamook	92,017.29	164,567.33	256,584.62
33	Corvallis-Newport	131,857.66	94,140.18	225,997.84
34	Siuslaw	19,175.11	56,567.11	75,742.22
35	Coos Bay-Roseburg	123,829.07	66,274.32	190,103.39
36	Pendleton-Cold Springs	3,279.93	5,159.07	8,439.00
37	Umatilla Cut-off			
38	Oregon Caves	7,423.36	3,767.52	11,190.88
40	Bertha-Beaverton	1,388.50	2,385.79	3,774.29
41	Ochoco	29,890.56	28,140.74	58,031.30
42	Sherman	54,092.42	71,477.49	125,569.91
43	Monmouth-Independence	392.99	802.79	1,195.78
44	Wapinitia	6.00	932.41	938.41
	Undistributed expense	100,523.79	110,281.85	210,755.64
	Totals	$*3,116,581.71	$ 3,295,107.30	$*6,411,689.01

* Includes $40,159.35 of federal government funds expended on the Old Oregon Trail Highway. The balance of the expenditures are all state funds.

R 30, 1928

tenance, and Forest Road Projects. For expenditures upon those classes

Total pended by unty to Date	GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
7,730.76		$	$	$	$ 8,825.65
3,310.06	16,244.37		16,244.37		2,588.66
	4,066.37		4,066.37		2,236.76
3,333.33				1,131.45	1,216.80
32,183.28				2,954.61	2,954.61
34,457.78				3,729.10	5,147.67
82,172.51				5,279.62	5,808.07
					3,140.44
					1,493.88
	5,903.61		5,903.61		983.52
13,500.00					
	45,917.47	45,917.47	45,917.47	3,957.69	3,979.46
26,867.30				1,227.39	1,725.92
27,057.87				1,422.66	1,769.27
13,168.43				2,239.49	2,239.49
22,773.26					
				1,470.57	3,932.23
20,684.05				2,910.79	5,836.99
17,989.11				3,687.76	3,998.10
4,889.87					931.79
10,947.14					860.17
7,213.30				465.07	1,112.84
5,642.88				964.79	1,525.43
2,736.47				908.98	908.98
7,170.92				757.28	1,717.23
				2,027.68	2,027.68
12,364.71					1,333.83
47,596.31					6,472.55
2,459.27					1,747.40
				51.75	51.75
	19,651.50	16,904.79	16,904.79	2,814.16	2,814.16

TABLE VIII

EXPENDITURES FOR MAINTENANCE WORK SUMMARIZED BY HIGHWAYS

December 1, 1926, to November 30, 1928

The amounts given in this table include all expenditures for general maintenance, special maintenance and operation and maintenance of draw bridges.

Hwy. No.	Highway Name	Expended Dec. 1, 1926, to Nov. 30, 1927	Expended Dec. 1, 1927, to Nov. 30, 1928	Total Expenditures 1927-1928 Biennium
1	Pacific	$ 235,145.62	$ 206,649.24	$ 441,794.86
2	Columbia River	230,493.12	340,664.07	571,157.19
3	West Side Pacific	43,420.25	26,861.21	70,281.46
4	The Dalles-California	348,243.10	409,960.99	758,204.09
5	John Day	162,892.51	164,654.56	327,547.07
6	Old Oregon Trail (State funds)	232,173.97	356,850.25	589,024.22
	(Government funds)	40,159.35		40,159.35
7	Central Oregon	6,773.68	6,866.89	13,640.57
8	Oregon-Washington	122,837.34	133,558.33	256,395.67
9	Roosevelt Coast	280,860.99	346,828.68	627,689.67
10	La Grande-Wallowa Lake	204,429.31	91,448.86	295,878.17
11	Enterprise-Flora	9,526.51	8,229.33	17,755.84
12	Baker-Cornucopia	17,383.16	18,963.73	36,346.89
13	Baker-Unity	17,468.45	17,041.80	34,510.25
14	Prineville-Central Oregon	5,331.64	3,952.29	9,283.93
15	McKenzie	34,822.58	85,535.40	120,357.98
16	Santiam	15,030.72	26,809.15	41,839.87
17	McKenzie-Bend	11,440.61	11,832.36	23,272.97
18	Willamette	2,771.21	10,793.51	13,564.72
19	Fremont	21,531.11	22,045.33	43,576.44
20	Klamath Falls-Lakeview	10,904.08	39,541.31	50,445.39
21	Ashland-Klamath Falls	87,723.03	95,422.53	183,145.56
22	Crater Lake	76,435.84	64,478.63	140,914.47
23	Dairy-Bonanza	2,215.97	1,567.77	3,783.74
24	Burns-Crane	4,500.78	5,124.15	9,624.93
25	Redwood	62,078.92	21,917.91	83,996.83
26	Mount Hood	212,548.98	93,828.11	306,377.09
27	Alsea	30,436.35	57,802.02	88,238.37
28	Pendleton-John Day	1,362.82	1,103.33	2,466.15
29	Tualatin Valley	10,948.27	8,668.17	19,616.44
30	Salem-Dallas	5,955.43	10,192.51	16,147.94
31	Albany-Corvallis	4,859.33	1,468.28	6,327.61
32	McMinnville-Tillamook	92,017.29	164,567.33	256,584.62
33	Corvallis-Newport	131,857.66	94,140.18	225,997.84
34	Siuslaw	19,175.11	56,567.11	75,742.22
35	Coos Bay-Roseburg	123,829.07	66,274.32	190,103.39
36	Pendleton-Cold Springs	3,279.93	5,159.07	8,439.00
37	Umatilla Cut-off			
38	Oregon Caves	7,423.36	3,767.52	11,190.88
40	Bertha-Beaverton	1,388.50	2,385.79	3,774.29
41	Ochoco	29,890.56	28,140.74	58,031.30
42	Sherman	54,092.42	71,477.49	125,569.91
43	Monmouth-Independence	392.99	802.79	1,195.78
44	Wapinitia	6.00	932.41	938.41
	Undistributed expense	100,523.79	110,281.85	210,755.64
	Totals	$*3,116,581.71	$ 3,295,107.30	$*6,411,689.01

* Includes $40,159.35 of federal government funds expended on the Old Oregon Trail Highway. The balance of the expenditures are all state funds.

TABLE IX

EXPENDITURES FOR NEW CONSTRUCTION WORK—DECEMBER 1, 1926, to NOVEMBER 30, 1928

In this table are listed the expenditures on all construction projects except those which come in the classes of Major Additions and Betterments, Special Maintenance, and Forest Road Projects. For expenditures upon those classes of work see Tables X, XI and XII.

PROJECT	Length in Miles	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE COOPERATION			COUNTY COOPERATION			GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
					State Share of Cost	Expended by State During 1927 and 1928	Total Expended by State to Date	County Share of Cost	Expended by County During 1927 and 1928	Total Expended by County to Date	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
BAKER COUNTY															
Grading and surfacing, Nelson-Malheur County Line	24.09	$ 126,812.62	$	$ 126,812.62	$ 100,009.29	$	$ 119,081.86	$ 26,803.33	$	$ 7,730.76	.....	$	$	$	$ 8,825.65
Surfacing, Canyon Section	4.42	35,420.61	.....	35,420.61	1,465.94	.....	15,866.18	17,710.30	.....	3,310.06	16,244.37	.....	16,244.37	.....	2,588.66
Surfacing, Baker-Middle Bridge	8.70	41,550.96	.....	41,550.96	26,261.62	.....	37,484.59	11,222.97	.....	.....	4,066.37	.....	4,066.37	.....	2,236.76
Surfacing, Dry Gulch Section	5.55	15,120.77	15,035.42	15,120.77	11,787.44	11,702.09	11,787.44	3,333.33	3,333.33	3,333.33	.....	.....	.....	1,131.45	1,216.80
Surfacing, Unity-Hereford	14.50	77,000.00	54,399.97	54,399.97	41,000.00	22,216.69	22,216.69	36,000.00	32,183.28	32,183.28	.....	.....	.....	2,954.61	2,954.61
Grading, Unity-Hereford	10.52	73,606.32	68,136.94	73,606.32	39,148.54	35,704.56	39,148.54	34,457.78	32,432.38	34,457.78	.....	.....	.....	3,729.10	5,147.67
Grading, Timber Canyon Section	3.55	87,980.58	87,452.13	87,980.58	5,808.07	5,279.62	5,808.07	82,172.51	82,172.51	82,172.51	.....	.....	.....	5,279.62	5,808.07
Huntington Overcrossing	.....	52,239.47	.....	52,239.47	33,727.59	.....	39,831.58	6,103.99	.....	.....	.....	.....	.....	.....	3,140.44
(O.-W. R. & N. Co. cooperates $12,407.89. Paid prior to 1927.)															
Durkee Undercrossing	.....	29,176.31	.....	29,176.31	11,767.48	.....	17,602.74	5,335.26	.....	.....	.....	.....	.....	.....	1,493.88
(O.-W. R. & N. Co. cooperates $11,573.57. Paid prior to 1927.)															
Unity Overcrossing	.....	11,338.50	.....	11,338.50	Cr. 1,368.21	.....	899.49	2,267.70	.....	.....	5,903.61	.....	5,903.61	.....	983.52
(O.-W. R. & N. Co. cooperates $4,535.40. Paid prior to 1927.)															
Bridge over Snake River at Homestead	.....	68,278.18	27,405.98	68,278.18	.....	Cr. 763.11	.....	13,500.00	.....	13,500.00	.....	.....	.....	.....	.....
(Idaho cooperates $26,260.84. Paid $4,749.05 prior to 1927 and $21,511.79 during 1927-28.)															
(Idaho Copper Co. cooperates $14,706.07. Paid $14,000 prior to 1927 and $706.07 during 1927-28.)															
(Oregon General Fund cooperates $13,811.27. Paid $7,860.04 prior to 1927 and $5,951.23 during 1927-28.)															
BAKER AND MALHEUR COUNTIES															
Surfacing Unity-Ironside	19.20	77,901.68	77,879.91	77,901.68	31,984.21	31,962.44	31,984.21	.....	.....	.....	45,917.47	45,917.47	45,917.47	3,957.69	3,979.46
BENTON COUNTY															
Surfacing, Gellatly Point-Corvallis	10.60	59,242.16	55,162.88	59,242.16	32,374.86	30,023.79	32,374.86	26,867.30	25,139.09	26,867.30	.....	.....	.....	1,227.39	1,725.92
Surfacing, Missouri Bend-Alsea Mountain	10.68	82,921.57	70,818.41	82,921.57	55,863.70	47,489.21	55,863.70	27,057.87	23,329.20	27,057.87	.....	.....	.....	1,422.66	1,769.27
Surfacing, Alsea Mountain-Philomath	6.10	47,000.00	44,698.98	44,698.98	32,000.00	31,530.55	31,530.55	15,000.00	13,168.43	13,168.43	.....	.....	.....	2,239.49	2,239.49
Grading, Gellatly Point-Corvallis	7.30	52,196.62	22,353.95	52,196.62	27,448.56	12,036.24	27,448.56	22,773.26	8,632.91	22,773.26					
(S. P. Co. cooperates $1,974.80. Paid $290 prior to 1927 and $1,684.80 during 1927-28)											.....	.....	.....	1,470.57	3,932.23
Grading, Missouri Bend-Alsea Mountain	10.65	67,897.15	26,345.94	67,897.15	47,213.10	18,496.20	47,213.10	20,684.05	7,849.74	20,684.05	.....	.....	.....	2,910.79	5,836.99
Grading, Alsea Mountain-Philomath	6.13	52,264.42	46,794.40	52,264.42	34,275.31	30,525.18	34,275.31	17,989.11	16,269.22	17,989.11	.....	.....	.....	3,687.76	3,998.10
Bridge over Digger Creek	.....	15,601.40	.....	15,601.40	10,711.53	Cr. 4,889.87	10,711.53	4,889.87	4,889.87	4,889.87	.....	.....	.....	.....	931.79
Bridge over Bowers Slough	.....	11,924.20	.....	11,924.20	977.06	Cr. 1,390.88	977.06	10,947.14	1,390.88	10,947.14	.....	.....	.....	.....	860.17
Bridge over Mary's River	.....	15,572.44	4,639.20	15,572.44	8,359.14	2,552.12	8,359.14	7,213.30	2,087.08	7,213.30	.....	.....	.....	465.07	1,112.84
Bridge over North Fork Alsea River	.....	18,504.64	13,389.42	18,504.64	12,861.76	9,264.73	12,861.76	5,642.88	4,124.69	5,642.88	.....	.....	.....	964.79	1,525.43
Bridge over Rock Creek	.....	9,118.39	9,118.39	9,118.39	6,381.92	6,381.92	6,381.92	2,736.47	2,736.47	2,736.47	.....	.....	.....	908.98	908.98
Wren Overcrossing	.....	20,378.07	10,423.90	20,378.07	8,921.15	3,447.58	8,921.15	7,170.92	2,690.32	7,170.92	.....	.....	.....	757.28	1,717.23
(S. P. Co. cooperates $4,286. All paid during 1927-28)															
BENTON, CLACKAMAS, LINN AND MARION COUNTIES															
Paving gaps on Pacific and Albany-Corvallis Highways	.....	31,548.81	31,548.81	31,548.81	31,359.09	31,359.09	31,359.09	.....	.....	.....	.....	.....	.....	2,927.68	2,027.68
(S. P. Co. cooperates $189.72. All paid during 1927-28)															
BENTON AND LINCOLN COUNTIES															
Surfacing, Missouri Bend Section	8.17	51,905.06	.....	51,905.06	34,540.35	Cr. 12,364.71	39,540.35	17,364.71	12,364.71	12,364.71	.....	.....	.....	.....	1,333.83
Grading, Missouri Bend Section	8.17	146,255.13	.....	146,255.13	98,658.82	Cr. 17,596.31	98,658.82	47,596.31	17,596.31	47,596.31	.....	.....	.....	.....	6,472.55
CLACKAMAS COUNTY															
Paving, Oregon City-Canemah	0.82	28,418.02	.....	28,418.02	14,372.17	Cr. 2,255.00	14,372.17	2,459.27	2,255.00	2,459.27	.....	.....	.....	.....	1,747.40
(Industries cooperate $11,586.58. Paid prior to 1927)															
Paving gaps, Oregon City-Canemah	.....	2,092.12	2,092.12	2,092.12	2,092.12	2,092.12	2,092.12	.....	.....	.....	.....	.....	.....	51.75	51.75
Bridge over Parrott Creek at New Era	.....	35,000.00	33,419.10	33,419.10	15,348.50	16,514.31	16,514.31	.....	.....	.....	19,651.50	16,904.79	16,904.79	2,814.16	2,814.16

PROJECT	Length in Miles	Estimated Total Cost	Expended Prior to July 1, 1957
BAKER COUNTY			
Grading and surfacing, Nelson-Malheur County Line	14.00	$ 1,324,213.00	$
Grading, Baker-Unity	15.4	82,414.00	
Surfacing, Baker-Unity	2.22	41,140.00	41,140.00
Surfacing, Pine Valley-Durkee	2.22	41,140.00	41,140.00
Surfacing, Unity-Prairie City	34.00	577,000.00	24,000.00
Prairie City-Dixie Section	10.47	178,809.57	24,000.00
Grading, Unity-Huntington	2.3	82,000.00	82,000.00
Huntington Overcrossing		25,000.00	
Durkee Undercrossing (O.-W. R. & N. Co. cooperates $11,000.00. Paid Prior to 1957.)		12,000.00	
Unity Overcrossing (O.-W. R. & N. Co. cooperates $11,213.75. Paid Prior to 1957.)		11,213.75	
Bridge over Snake River at Homestead (Idaho cooperates $56,000.00. Paid $4,747.00 prior to 1957 and $51,211.07 during 1957-58.)		112,000.00	112,000.00
Bridge over Powder River (Idaho Copper Co. cooperates $14,707.07. Paid $14,000 prior to 1957 and $707.07 during 1957-58.)		14,707.07	
Bridge over Burnt River (Oregon General Fund cooperates $13,211.31. Paid $7,038.04 prior to 1957 and $6,173.27 during 1957-58.)		13,211.31	
Surfacing, Unity-Ironside	16.50	330,000.00	330,000.00
BAKER AND MALHEUR COUNTIES			
Surfacing, Brogan-Ironside	14.00	280,000.00	280,000.00
BENTON COUNTY			
Grading, Corvallis-Albany (S. P. Co. cooperates $1,814.20. Paid $750 prior to 1957 and $1,064.20 during 1957-58)	10.40	53,313.40	53,313.40
Grading, Albany-Corvallis	7.30	32,100.00	32,100.00
Surfacing, Albany-Corvallis	6.10	47,000.00	47,000.00
Surfacing, Marion Road-Albany Section	10.28	85,152.72	10,218.72
Grading, Albany-Corvallis (S. P. Co. cooperates $1,814.20. Paid $750 prior to 1957 and $1,064.20 during 1957-58)	10.40	53,313.40	53,313.40
BENTON AND LINCOLN COUNTIES			
Surfacing, Marion Road Section	8.14	84,302.00	
Corvallis-Newport (Oregon Coast Highway)	8.14	168,522.18	
CLACKAMAS COUNTY			
Estacada-Oregon City-Canemah	6.83	58,418.93	
Estacada-Oregon City-Canemah (Oregon Coast Highway) Price to 1957)			
Estacada-Oregon City-Canemah		3,695.45	3,695.45
Bridge over Detroit Creek at New Era		22,000.00	22,413.11
Estacada-Marion Road Section	11.8	84,302.00	
Corvallis-Albany (S. P. Co. cooperates $183.15. All Paid during 1957-58)			
Highway 9		81,248.81	81,248.81
BENTON, CLACKAMAS, LINN AND MARION COUNTIES			
Corvallis-Albany (S. P. Co. cooperates $1,814. All Paid during 1957-58)			
Albany Overcrossing		30,818.91	10,153.21
Bridge over Hoak Creek		9,118.38	9,118.38
Bridge over Marys River at Albany		15,284.04	15,284.04
Bridge over Marys River		4,813.44	4,639.77
Bridge over Powers Slough		11,854.30	
Bridge over Pioneer Cut		13,041.40	
Grading, Albany-Millersburg-Tangent	8.13	85,304.43	85,304.43
Grading, Missouri Road-Albany Section (S. P. Co. cooperates $1,814.20. Paid $750 prior to 1957 and $1,064.20 during 1957-58)	10.28	63,259.12	38,342.92
Grading, Gellatly Point-Corvallis	7.30	32,100.00	32,285.00
Surfacing, Albany-Millersburg	6.10	44,000.00	44,208.00
Surfacing, Marion Road-Albany Section	10.28	85,152.72	10,218.72
Surfacing, Unity-Ironside	16.50	330,000.00	330,000.00

EXPENDITURE

It is this table are listed the expenditures on all construction projects except those of Tables X, XI and XII.

Total Expended by County to Date	GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
.....	$	$	$	$ 495.30	$ 495.30
30,000.00	39,964.76	33,099.90	39,964.76	495.72	4,128.31
70,000.00	94,268.79	.....	94,268.79	109.70	7,542.43
.....	.....	.....	.....	.....	848.18
.....	.....	.....	.....	638.32	638.32
2,000.00	31,292.42	10,877.19	10,877.19	4,996.88	4,996.88
50,411.09	131,357.48	109,604.47	109,604.47	11,069.57	11,399.70
.....	.....	.....	.....	2,410.99	2,410.99
.....	.....	.....	.....	4,188.17	4,188.17
660.50	91,414.12	16,910.96	91,414.12	79.51	6,896.44
6,000.00	106,811.51	63,652.56	106,811.51	2,560.14	14,650.16
.....	61,061.83	35,166.46	61,061.83	839.41	6,112.11
.....	103,823.78	60,664.83	103,823.78	3,954.69	13,834.54
.....	148,826.53	88,404.00	148,826.53	3,146.16	18,646.59
.....	50,806.80	11,520.13	50,806.80	708.49	5,266.02
.....	76,917.72	17,987.72	76,917.72	279.46	5,591.24
.....	.....	.....	.....	7,016.62	7,016.62
.....	.....	.....	.....	47.60	4,539.32
.....	38,223.90	38,223.90	38,223.90	2,102.93	3,261.23
.....	.....	.....	.....	567.54	567.54
.....	.....	.....	.....	2,080.79	2,080.79
.....	.....	.....	.....	1,659.86	1,659.86
.....	.....	.....	.....	750.00	750.00
.....	50,960.87	32,539.43	50,960.87	112.75	1,805.04
3,720.62	.....	.....	.....	710.69	1,557.68
.....	.....	.....	.....	3,539.86	3,539.86
882.16	.....	.....	.....	82.35	978.84
4,801.74	.....	.....	.....	55.81	2,546.67
.....	125,937.04	Cr. 56,786.63	125,937.04	357.88	4,181.05
6,421.34	9,412.20	.....	9,412.20	.....	1,543.74
.....	5,797.63	.....	.....	390.31	390.31
26,000.00	50,490.00	40,569.07	40,569.07	3,059.32	4,303.54
21,403.54	36,490.95	24,971.34	24,971.34	2,494.76	2,494.76
3,500.00	6,529.04	.....	.....	577.67	577.67
6,500.00	12,472.14	10,941.94	10,941.94	1,416.65	1,416.65
45,000.00	66,502.92	.....	.....	3,194.10	3,194.10
15,671.58	29,255.91	.....	29,255.91	.....	3,082.45
18,622.21	.....	.....	.....	2,816.95	2,816.95
.....	.....	.....	.....	40.00	40.00
.....	1,722.00	1,722.00	1,722.00	192.39	192.39
6,952.24	7,455.01	7,455.01	7,455.01	747.43	747.43
.....	.....	.....	.....	1,153.43	1,153.43
20,706.01	22,369.68	22,369.68	22,369.68	1,995.68	3,521.09
39,282.18	.....	.....	.....	366.51	8,795.19
.....	.....	.....	.....	21.98	343.50

EXPENDITURE ON CONSTRUCTION — DECEMBER 1, 1926, to NOVEMBER

In this table are listed the expenditures on all construction projects except ... of work see Tables X, XI and XII.

PROJECT	Length in Miles	Estimated Total Cost	Expended during 1927 and 1928
BAKER COUNTY			
Grading and surfacing, Nelson-Malheur County Line	24.00	$136,212.62	$
Surfacing, Canyon Section	1.12	35,419.61	
Surfacing, Baker-Middle Bridge	8.70	41,560.36	
Surfacing, Dry Gulch Section	5.55	15,126.77	15,035.4
Surfacing, Unity-Hereford	14.50	77,000.00	54,329.9
Grading, Unity-Hereford	10.52	72,606.33	68,126.9
Grading, Timber Canyon Section	3.65	87,950.55	87,452.1
Huntington Overcrossing (O.-W. R. & N. Co. cooperates $12,407.89. Paid prior to 1927.)		52,239.47	
Durkee Undercrossing (O.-W. R. & N. Co. cooperates $11,513.57. Paid prior to 1927.)		29,176.31	
Unity Overcrossing (O.-W. R. & N. Co. cooperates $4,585.41. Paid prior to 1927.)		11,338.50	
Bridge over Snake River at Homestead (Idaho cooperates $26,260.84. Paid $4,749.05 prior to 1927 and $21,511.79 during 1927-28.) (Idaho Copper Co. cooperates $14,706.07. Paid $14,000 prior to 1927 and $706.07 during 1927-28.) (Oregon General Fund cooperates $13,811.27. Paid $7,860.04 prior to 1927 and $5,951.23 during 1927-28.)		63,378.18	27,406.9
BAKER AND MALHEUR COUNTIES			
Surfacing Unity-Ironside	19.20	77,901.68	77,379.5
BENTON COUNTY			
Surfacing, Gellatly Point-Corvallis	10.60	59,242.16	55,165.8
Surfacing, Missouri Bend-Alsea Mountain	10.65	82,921.57	76,513.4
Surfacing, Alsea Mountain-Philomath	6.10	47,000.00	44,698.9
Grading, Gellatly Point-Corvallis (S. P. Co. cooperates $1,974.50. Paid $290 prior to 1927 and $1,684.80 during 1927-28)	7.30	32,136.02	32,258.9
Grading, Missouri Bend-Alsea Mountain	10.65	67,897.15	26,345.9
Grading, Alsea Mountain-Philomath	6.13	52,264.12	46,794.4
Bridge over Digger Creek		13,661.40	
Bridge over Bowers Slough		11,924.20	
Bridge over Mary's River		15,572.44	14,639.9
Bridge over North Fork Alsea River		13,564.64	12,389.4
Bridge over Rock Creek		9,118.39	9,118.3
Wren Overcrossing (S. P. Co. cooperates $4,286. All paid during 1927-28)		20,378.91	10,123.9
BENTON, CLACKAMAS, LINN AND MARION COUNTIES			
Paving gaps on Pacific and Albany-Corvallis Highways (S. P. Co. cooperates $189.72. All paid during 1927-28)		31,548.81	31,548.8
BENTON AND LINCOLN COUNTIES			
Surfacing, Missouri Bend Section	8.17	61,995.06	
Grading, Missouri Bend Section	8.17	146,355.18	
CLACKAMAS COUNTY			
Paving, Oregon City-Canemah (Industries cooperate $11,586.68. Paid prior to 1927)	0.83	28,418.02	
Paving gaps, Oregon City-Canemah		2,092.12	2,092.1
Bridge over Parrott Creek at New Era		35,000.00	33,419.1

TABLE IX—Continued

PROJECT	Length in Miles	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE COOPERATION			COUNTY COOPERATION			GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
					State Share of Cost	Expended by State During 1927 and 1928	Total Expended by State to Date	County Share of Cost	Expended by County During 1927 and 1928	Total Expended by County to Date	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
CLATSOP COUNTY															
Paving, Lewis and Clark Bridge approaches	0.29	$ 11,929.25	$ 11,929.25	$ 11,929.25	$ 11,929.25	$ 11,929.25	$ 11,929.25	$	$	$	$	$	$	$ 495.30	$ 495.30
Surfacing, Cannon Beach Junction-Hamlet Junction	10.30	89,426.23	10,609.37	89,426.23	19,461.47	Cr. 52,490.53	19,461.47	30,000.00	30,000.00	30,000.00	39,964.76	33,099.90	39,964.76	495.72	4,128.31
Grading, Cannon Beach Junction-Hamlet Junction	10.30	183,243.92	17,146.60	183,243.92	18,975.13	Cr. 2,853.41	18,975.13	70,000.00	20,000.01	70,000.00	94,268.79	.....	94,268.79	109.70	7,542.43
Bridge over Bear Creek near Svensen	.....	8,384.66	160.00	8,384.66	8,384.66	160.00	8,384.66	.....	.....	.....	.....	.....	.....	.....	348.18
COOS COUNTY															
Bridge over North Slough	.....	9,933.74	9,933.74	9,933.74	9,933.74	9,933.74	9,933.74	.....	.....	.....	.....	.....	.....	638.32	638.32
COOS AND DOUGLAS COUNTIES															
Surfacing, Reedsport-Lakeside	11.32	115,000.00	86,926.29	86,926.29	54,707.58	74,049.10	74,049.10	29,000.00	2,000.00	2,000.00	31,292.42	10,877.19	10,877.19	4,996.88	4,996.88
Grading, Winchester Bay-Lakeside	6.92	230,042.12	229,711.99	230,042.12	33,273.55	75,107.52	70,026.56	65,411.09	45,000.00	50,411.09	131,357.48	109,604.47	109,604.47	11,069.57	11,399.70
CURRY COUNTY															
Surfacing, north unit, Myers Creek-Chetco River	8.18	51,018.46	51,018.46	51,018.46	51,018.46	51,018.46	51,018.46	.....	.....	.....	.....	.....	.....	2,410.99	2,410.99
Surfacing, south unit, Myers Creek-Chetco River	20.00	167,103.94	167,103.94	167,103.94	167,103.94	167,103.94	167,103.94	.....	.....	.....	.....	.....	.....	4,188.17	4,188.17
Grading, Myers Creek-Burnt Hill	5.40	168,524.52	2,694.31	168,524.52	76,449.90	Cr. 14,216.65	76,449.90	660.50	.....	660.50	91,414.12	16,910.96	91,414.12	79.51	6,896.44
Grading, Unit 1, Burnt Hill-Chetco River	5.80	280,871.40	31,841.88	280,871.40	168,059.89	Cr. 37,810.68	168,059.89	6,000.00	6,000.00	6,000.00	106,811.51	63,652.56	106,811.51	2,560.14	14,650.16
Grading, Unit 2, Burnt Hill-Chetco River	3.40	110,697.07	11,968.40	110,697.07	49,635.24	Cr. 23,198.06	49,635.24	.....	.....	.....	61,061.83	35,166.46	61,061.83	839.41	6,112.11
Grading, Unit 3, Burnt Hill-Chetco River	5.70	252,000.00	52,759.06	245,141.08	148,176.22	Cr. 7,905.77	141,317.30	.....	.....	.....	103,823.78	60,664.83	103,823.78	3,954.69	13,834.54
Grading, Unit 4, Burnt Hill-Chetco River	8.30	305,683.50	36,843.23	305,683.50	156,856.97	Cr. 51,560.77	156,856.97	.....	.....	.....	148,826.53	88,404.00	148,826.53	3,146.16	18,646.59
Grading, north unit, Euchre Creek-Rogue River	7.01	80,853.86	5,837.62	80,853.86	30,047.06	Cr. 5,682.51	30,047.06	.....	.....	.....	50,806.80	11,520.13	50,806.80	708.49	5,266.02
Grading, south unit, Euchre Creek-Rogue River	3.98	130,436.97	3,594.27	130,436.97	53,519.25	Cr. 14,393.45	53,519.25	.....	.....	.....	76,917.72	17,987.72	76,917.72	279.46	5,591.24
Slide removal, Pistol River-Chetco River	.....	70,346.02	70,346.02	70,346.02	70,346.02	70,346.02	70,346.02	.....	.....	.....	.....	.....	.....	7,016.62	7,016.62
Bridge over Chetco River	.....	99,622.41	11,754.36	99,622.41	99,622.41	11,754.36	99,622.41	.....	.....	.....	.....	.....	.....	47.60	4,539.32
Bridge over Pistol River	.....	68,681.94	67,523.64	68,681.94	30,458.04	29,299.74	30,458.04	.....	.....	.....	38,223.90	38,223.90	38,223.90	2,102.93	3,261.23
Bridge over Euchre Creek	.....	10,091.76	10,091.76	10,091.76	10,091.76	10,091.76	10,091.76	.....	.....	.....	.....	.....	.....	567.54	567.54
Bridge over Hunters Creek	.....	26,277.62	26,277.62	26,277.62	26,277.62	26,277.62	26,277.62	.....	.....	.....	.....	.....	.....	2,080.79	2,080.79
Ferry boat at Rogue River	.....	20,655.20	20,655.20	20,655.20	20,655.20	20,655.20	20,655.20	.....	.....	.....	.....	.....	.....	1,659.86	1,659.86
Ferry slips at Rogue River ferry	.....	24,951.45	24,951.45	24,951.45	24,951.45	24,951.45	24,951.45	.....	.....	.....	.....	.....	.....	750.00	750.00
DESCHUTES COUNTY															
Surfacing, Bend-Lava Butte	9.06	89,289.67	Cr. 429.47	89,289.67	38,328.80	Cr. 32,968.90	38,328.80	.....	.....	.....	50,960.87	32,539.43	50,960.87	112.75	1,805.04
Grading, Pilot Butte Section	1.41	9,028.00	8,181.01	9,028.00	5,307.38	4,460.39	5,307.38	3,720.62	3,720.62	3,720.62	.....	.....	.....	710.69	1,557.68
Grading, Millican-Hampton	.....	59,210.58	59,210.58	59,210.58	59,210.58	59,210.58	59,210.58	.....	.....	.....	.....	.....	.....	3,539.86	3,539.86
DESCHUTES AND JEFFERSON COUNTIES															
Surfacing, Crooked River Section	4.55	30,414.32	9,011.84	30,414.32	20,532.16	8,129.68	29,532.16	9,882.16	882.16	882.16	.....	.....	.....	82.35	978.84
Grading, Crooked River Section	4.55	13,925.89	402.18	13,925.89	9,124.15	Cr. 4,399.56	9,124.15	4,801.74	4,801.74	4,801.74	.....	.....	.....	55.81	2,546.67
DESCHUTES AND KLAMATH COUNTIES															
Surfacing, Lapine-Corral Springs	28.20	226,492.50	37,931.21	226,492.50	100,555.46	94,717.84	100,555.46	.....	.....	.....	125,937.04	Cr. 56,786.63	125,937.04	357.88	4,181.05
DOUGLAS COUNTY															
Grading and surfacing, Oakland Overcrossing approaches	0.42	19,394.08	.....	19,394.08	3,560.54	Cr. 6,421.34	3,560.54	6,421.34	6,421.34	6,421.34	9,412.20	.....	9,412.20	.....	1,543.74
Surfacing, Reedsport Section	1.00	10,133.45	10,133.45	10,133.45	4,335.82	10,133.45	10,133.45	.....	.....	.....	5,797.63	.....	.....	390.31	390.31
Grading, Reedsport-Winchester Bay	3.29	95,879.49	73,483.02	95,879.49	19,389.49	6,913.95	29,310.42	26,000.00	26,000.00	26,000.00	50,490.00	40,569.07	40,569.07	3,059.32	4,303.54
Grading, Gardiner Summit Section	1.95	85,961.84	85,961.84	85,961.84	21,648.53	39,586.96	39,586.96	27,822.36	21,403.54	21,403.54	36,490.95	24,971.34	24,971.34	2,494.76	2,494.76
Grading, Reedsport Section	1.06	9,677.34	9,677.34	9,677.34	Cr. 351.70	6,177.34	6,177.34	3,500.00	3,500.00	3,500.00	6,529.04	.....	.....	577.67	577.67
Bridge over Schofield River	.....	24,000.00	21,117.71	21,117.71	5,027.86	3,675.77	3,675.77	6,500.00	6,500.00	6,500.00	12,472.14	10,941.94	10,941.94	1,416.65	1,416.65
Bridge over Umpqua River at Scottsburg	.....	112,000.00	15,086.89	15,086.89	.....	Cr. 29,913.11	Cr. 29,913.11	45,497.08	45,000.00	45,000.00	66,502.92	.....	.....	3,194.10	3,194.10
Bridge and Overcrossing at Oakland (S. P. Co. cooperates $5,965.20. Paid prior to 1927)	.....	48,223.32	.....	48,223.32	Cr. 2,669.37	Cr. 13,169.74	Cr. 2,669.37	15,671.58	13,169.74	15,671.58	29,255.91	.....	29,255.91	.....	3,082.45
HARNEY COUNTY															
Grading, Buchanan-Nigger Flat	3.43	47,000.00	40,061.36	40,061.36	25,000.00	21,439.15	21,439.15	22,000.00	18,622.21	18,622.21	.....	.....	.....	2,816.95	2,816.95
Bridge over Silvies Creek	.....	2,060.72	2,060.72	2,060.72	2,060.72	2,060.72	2,060.72	.....	.....	.....	.....	.....	.....	40.00	40.00
JACKSON COUNTY															
Surfacing, Rogue River Bridge approaches	0.32	2,848.27	2,848.27	2,848.27	1,126.27	1,126.27	1,126.27	.....	.....	.....	1,722.00	1,722.00	1,722.00	192.39	192.39
Grading, Rogue River Bridge approaches	0.36	14,660.41	14,660.41	14,660.41	253.16	253.16	253.16	6,952.24	6,952.24	6,952.24	7,455.01	7,455.01	7,455.01	747.43	747.43
Bridge over Foots Creek	.....	9,263.90	9,263.90	9,263.90	9,263.90	9,263.90	9,263.90	.....	.....	.....	.....	.....	.....	1,153.43	1,153.43
Bridge over Rogue River at Gold Hill (S. P. Co. cooperates $10,500. All paid during 1927-28)	.....	55,520.12	51,378.92	55,520.12	1,944.43	Cr. 2,196.77	1,944.43	20,706.01	20,706.01	20,706.01	22,369.68	22,369.68	22,369.68	1,995.68	3,521.09
JEFFERSON COUNTY															
Bridge over Crooked River	.....	140,434.60	11,402.04	140,434.60	101,152.42	Cr. 7,880.14	101,152.42	39,282.18	19,282.18	39,282.18	.....	.....	.....	366.51	8,795.19
Crooked River Undercrossing (O. T. Ry. cooperates $740. All paid during 1927-28)	.....	4,405.31	588.29	4,405.31	3,665.31	Cr. 151.71	3,665.31	.....	.....	.....	.....	.....	.....	21.98	343.50

PROJECT	Miles in Section	Total Cost	Federal Funds Allocated
DESCHUTES COUNTY			
Bridge over Deschutes River at Bend (S. P. Co. cooperates $10,000. All paid prior to 1951)	0.05	$ 80,000.00	$ 40,000.00
Bridge over Deschutes River at Bend (S. P. Co. cooperates $10,000. All paid 1951-52)	0.05	80,000.00	40,000.00
Bridge over Deschutes River at Gold Hill (S. P. Co. cooperates $10,000. All paid 1951-52)	0.05	80,000.00	40,000.00
Bridge over Fourmile Creek	0.05	80,000.00	40,000.00
Bridge over Squaw Creek	0.05	80,000.00	40,000.00
Bridge over Tumalo Creek	0.05	80,000.00	40,000.00
Bridge over Whychus Creek	0.05	80,000.00	40,000.00
Bridge over Wickiup Reservoir	0.05	80,000.00	40,000.00
Redmond, Cline Falls Highway-Cascade Highway	0.05	80,000.00	40,000.00
Redmond, Cline Falls Highway-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Dry Canyon Creek-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Evergreen Avenue-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Hemlock Avenue-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Maple Avenue-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Obsidian Avenue-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Sisters Highway-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Yew Avenue-Deschutes River	0.05	80,000.00	40,000.00
Redmond, Yew Avenue-Railroad	0.05	80,000.00	40,000.00
Redmond, Yew Avenue-Sisters Highway	0.05	80,000.00	40,000.00
Redmond, Yew Avenue-Tumalo Highway	0.05	80,000.00	40,000.00
Redmond, Yew Avenue-Underpass	0.05	80,000.00	40,000.00
Redmond, Yew Avenue-Veterans Memorial Highway

Total Expended by County to Date	GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
10,000.00	$	$	$	$	$ 2,203.13
10,000.00	.....	.....	.....	.....	2,297.34
.....	18,099.18	18,099.18	18,099.18	186.29	2,698.15
.....	12,366.41	12,366.41	12,366.41	1,092.46	1,092.46
.....	38,161.20	13,213.13	13,213.13	4,352.73	4,352.73
.....	43,806.45	Cr. 2,317.17	43,806.45	.....	5,714.22
20,000.00	.....	.....	.....	.....	5,054.02
.....	.....	.....	.....	.....	1,966.19
.....	31,277.40	31,277.40	31,277.40	5,349.30	5,633.66
.....	78,929.40	76,405.16	76,405.16	12,293.60	12,293.60
20,000.00	.....	.....	.....	Cr. 651.00	4,687.24
.....	11,021.64	11,021.64	11,021.64	14.48	2,609.37
.....	16,320.87	13,324.18	13,324.18	1,893.24	1,893.24
.....	.....	.....	.....	364.07	364.07
39,141.62	.....	.....	.....	1,179.59	4,377.21
.....	.....	.....	.....	3,294.14	3,294.14
.....	.....	.....	.....	.....	.....
68,710.63	.....	.....	.....	57.83	7,389.62
31,043.92	.....	.....	.....	4,687.75	6,864.66
22,880.77	.....	.....	.....	6,493.76	6,493.76
.....	14,830.20	Cr. 2,360.10	14,830.20	.....	4,312.01
.....	.....	.....	.....	4,476.24	5,128.50
1,720.40	.....	.....	.....	616.74	616.74
23,971.92	18,077.40	16,076.31	16,076.31	2,966.43	2,966.43
.....	27,609.11	3,421.78	3,421.78	1,693.87	1,693.87
28,736.43	.....	.....	.....	301.98	7,345.03
47,869.99	.....	.....	.....	2,803.71	2,803.71
138,856.81	.....	.....	.....	4,453.92	4,453.92
7,680.34	.....	.....	.....	2,226.10	2,226.10
2,817.38	11,480.70	7,902.00	7,902.00	2,368.09	2,368.09
42,716.62	87,168.67	65,484.40	65,484.40	5,415.75	5,415.75
6,902.99	74,540.97	.....	74,540.97	.....	5,083.38
122,347.15	123,523.91	55,896.35	123,523.91	21.97	9,566.98
40,816.88	.....	.....	.....	.....	3,796.99
.....	.....	.....	.....	19.57	3,439.93
.....	39,992.70	.....	.....	5,862.64	5,862.64
.....	107,603.10	27,444.51	107,763.42	399.12	8,459.11
.....	66,333.30	51,578.13	66,333.30	1,097.00	6,123.02
5,000.00	.....	.....	.....	670.06	1,882.42
.....	30,048.15	30,048.15	30,048.15	1,779.38	3,429.63
.....	32,422.50	35,072.21	35,072.21	1,164.43	3,187.63
51,478.63	.....	.....	.....	.....	9,402.06
7,570.06	.....	.....	.....	518.54	518.54
46,223.61	.....	.....	.....	9,930.17	9,930.17
7,777.07	.....	.....	.....	1,173.60	1,173.60
.....	.....	.....	.....	.....	3,654.76
.....	38,717.88	39,883.98	39,883.98	3,248.54	5,226.46
.....	22,364.10	.....	.....	2,489.30	2,489.30
.....	60,012.89	.....	60,012.89	.....	4,558.39
10,631.25	22,504.10	.....	22,504.10	.....	2,655.81
15,000.00					
10,472.14	.....	.....	.....	1,258.34	1,258.34
30,239.05	.....	.....	.....	3,541.83	3,541.83
40,000.00	.....	.....	.....	342.14	9,548.28

Project	Miles in Length	Estimated Total Cost	Estimated Federal Aid
CROOK COUNTY			
Prineville, Bend-Lava Butte	20.0	$ 78,852,000	$ 2,882,000
Prineville, Pilot Butte Section	4.1	2,820,000	1,128,000
Prineville, Millican-Hampton	11.1	4,515,000	1,806,000
DESCHUTES AND JEFFERSON COUNTIES			
Redmond, Crooked River Section	15.4	6,011,000	2,404
Bridge over Crooked River	----	1,200,000	480,000
JEFFERSON COUNTY			
(S. P. Co. cooperates $10,000. All bridge work 1957-58)			
Madras-Bend Highway at Gold Hill	----	1,000,000	400,000
Bridge over Lodge Creek	----	60,000	60,000
Bridge over Horse River	----	1,000,000	400,000
JACKSON COUNTY			
Bridge over Rogue River at Gold Hill	----	1,000,000	400,000
Grants Pass-Medford Highway	8.48	2,000,000	1,600,000
HARNEY COUNTY			
(S. P. Co. cooperates $1,000. All bridge work 1957-58)			
Burns-Crane Highway	----	1,000,000	400,000
Burns-Hines Highway	----	1,000,000	400,000
Burns-Diamond Highway	----	1,000,000	400,000
Bridge over Silvies River	----	1,000,000	400,000
Burns-Crane Highway	8.48	2,000,000	1,600,000
LAKE COUNTY			
Bridge over Chewaucan River	----	1,000,000	400,000
Bridge over Silver Lake	----	1,000,000	400,000
Lakeview-Silver Lake Highway	15.0	3,000,000	1,200,000
Lakeview-Paisley Highway	24.0	4,800,000	1,920,000
LANE COUNTY			
(S. P. Co. cooperates $1,000. All bridge work 1957-58)			
Eugene-Cottage Grove Highway	----	1,000,000	400,000
Eugene-Florence Highway	----	2,000,000	800,000
Eugene-Junction City Highway	----	1,000,000	400,000
Eugene-Veneta Highway	----	1,000,000	400,000
Eugene-Coburg Highway	----	1,000,000	400,000
Bridge over Willamette River at Harrisburg	----	1,000,000	400,000
Bridge over Willamette River at Peoria	----	1,000,000	400,000
Bridge over Willamette River at Corvallis	----	1,000,000	400,000
Bridge over Willamette River at Albany	----	1,000,000	400,000
Bridge over Willamette River at Coburg	----	1,000,000	400,000
Bridge over Willamette River at Goshen	----	1,000,000	400,000
Bridge over Willamette River at Jasper	----	1,000,000	400,000
Bridge over Willamette River at Dexter	----	1,000,000	400,000
Bridge over Willamette River at Oakridge	----	1,000,000	400,000
Bridge over Willamette River at Springfield	----	1,000,000	400,000
Bridge over Willamette River at Eugene

TABLE IX—Continued

PROJECT	Length in Miles	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE COOPERATION: State Share of Cost	STATE COOPERATION: Expended by State During 1927 and 1928	STATE COOPERATION: Total Expended by State to Date	COUNTY COOPERATION: County Share of Cost	COUNTY COOPERATION: Expended by County During 1927 and 1928	COUNTY COOPERATION: Total Expended by County to Date	GOVERNMENT COOPERATION: Government Share of Cost	GOVERNMENT COOPERATION: Expended by Government During 1927 and 1928	GOVERNMENT COOPERATION: Total Expended by Government to Date	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Cost During 1927 and 1928	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Total Cost to Date
JOSEPHINE COUNTY															
Surfacing, O'Brien School-George Ranch	8.64	$ 43,797.20	$ 2,552.51	$ 43,797.20	$ 33,797.20	Cr. $ 7,447.49	$ 33,797.20	$ 10,000.00	$ 10,000.00	$ 10,000.00	$	$	$	$	$ 2,203.13
Surfacing, Redwood Jct.-Grayback Creek	11.78	51,530.72	1,401.58	51,530.72	41,530.72	Cr. 8,598.42	41,530.72	10,000.00	10,000.00	10,000.00	.....	.....	.....	.....	2,297.34
Surfacing, George Ranch-Deer Creek	6.87	34,929.65	1,463.23	34,929.65	16,830.47	Cr. 16,635.95	16,830.47	.....	.....	.....	18,099.18	18,099.18	18,099.18	186.29	2,698.15
Surfacing, Deer Creek-Hayes Hill	4.80	21,343.24	21,343.24	21,343.24	8,976.83	8,976.83	8,976.83	.....	.....	.....	12,366.41	12,366.41	12,366.41	1,092.46	1,092.46
Surfacing, Hayes Hill-Shattuck Corner	10.92	77,985.74	77,985.74	77,985.74	39,824.54	64,772.61	64,772.61	.....	.....	.....	38,161.20	13,213.13	13,213.13	4,352.73	4,352.73
Grading, George Ranch-Deer Creek	6.88	73,210.54	.....	73,210.54	29,404.09	2,317.17	29,404.09	.....	.....	.....	43,806.45	Cr. 2,317.17	43,806.45	.....	5,714.22
Grading, O'Brien School-George Ranch	8.17	68,244.34	859.00	68,244.34	48,244.34	859.00	48,244.34	20,000.00	.....	20,000.00	.....	.....	.....	.....	5,054.02
Grading, Redwood Junction-Wells Ranch	4.32	24,749.49	121.60	24,749.49	24,749.49	121.60	24,749.49	.....	.....	.....	.....	.....	.....	.....	1,966.19
Grading, Deer Creek-Hayes Hill	4.80	52,059.05	51,774.69	52,059.05	20,781.65	20,497.29	20,781.65	.....	.....	.....	31,277.40	31,277.40	31,277.40	5,349.30	5,633.66
Grading, Hayes Hill-Shattuck Corner	10.69	144,134.12	144,134.12	144,134.12	65,204.72	67,728.96	67,728.96	.....	.....	.....	78,929.40	76,405.16	76,405.16	12,293.60	12,293.60
Bridges, Redwood and Oregon Caves Highways	.....	69,121.85	2,049.68	69,121.85	49,121.85	Cr. 17,950.32	49,121.85	20,000.00	20,000.00	20,000.00	.....	.....	.....	Cr. 651.00	4,687.24
Bridges, George Ranch-Deer Creek	.....	19,167.75	433.73	19,167.75	8,146.11	Cr. 10,587.91	8,146.11	.....	.....	.....	11,021.64	11,021.64	11,021.64	14.48	2,609.37
Bridges on Redwood Highway near Grants Pass	.....	24,906.01	24,906.01	24,906.01	8,585.14	11,581.83	11,581.83	.....	.....	.....	16,320.87	13,324.18	13,324.18	1,893.24	1,893.24
Culvert over Allen Creek near Grants Pass	.....	3,604.17	3,604.17	3,604.17	3,604.17	3,604.17	3,604.17	.....	.....	.....	.....	.....	.....	364.07	364.07
KLAMATH COUNTY															
Surfacing, Bly Mountain-Beatty	13.45	82,660.45	31,446.42	82,660.45	43,518.83	15,073.39	43,518.83	39,141.62	16,373.03	39,141.62	.....	.....	.....	1,179.59	4,377.21
Surfacing, Beatty-Forest Boundary	21.30	180,000.00	79,873.00	79,873.00	180,000.00	79,873.00	79,873.00	.....	.....	.....	.....	.....	.....	3,294.14	3,294.14
Paving materials, Klamath Falls-Lakeview Jctn.	.....	2,205.00	2,205.00	2,205.00	2,205.00	2,205.00	2,205.00	.....	.....	.....	.....	.....	.....	.....	.....
Grading, Bly Mountain-Beatty	13.45	144,810.90	4,688.86	144,810.90	76,100.27	2,373.35	76,100.27	68,710.63	2,315.51	68,710.63	.....	.....	.....	57.83	7,389.62
Grading, Beatty-Bly	13.00	68,952.49	37,703.03	68,952.49	37,908.57	6,659.11	37,908.57	31,043.92	31,043.92	31,043.92	.....	.....	.....	4,687.75	6,864.66
Grading, Bly-Forest Boundary	8.01	81,000.00	71,824.56	71,824.56	56,000.00	48,943.79	48,943.79	25,000.00	22,880.77	22,880.77	.....	.....	.....	6,493.76	6,493.76
Grading, Deschutes County Line-Crescent	13.36	28,443.61	.....	28,443.61	13,613.41	2,360.10	13,613.41	.....	.....	.....	14,830.20	Cr. 2,360.10	14,830.20	.....	4,312.01
LAKE COUNTY															
Surfacing, Drews Valley-Lakeview	16.10	76,373.15	75,380.89	76,373.15	76,373.15	75,380.89	76,373.15	.....	.....	.....	.....	.....	.....	4,476.24	5,128.50
Surfacing Streets in City of Lakeview	.....	6,210.21	6,210.21	6,210.21	3,805.45	4,489.81	4,489.81	2,404.76	1,720.40	1,720.40	.....	.....	.....	616.74	616.74
Grading, Chalk Cliff-Paisley	9.48	32,000.00	31,847.96	31,847.96	5,931.96	Cr. 8,200.27	Cr. 8,200.27	7,990.64	23,971.92	23,971.92	18,077.40	16,076.31	16,076.31	2,966.43	2,966.43
Grading, Ana Spring-Hunter Hill	11.02	46,000.00	14,139.82	14,139.82	18,390.89	10,718.04	10,718.04	.....	.....	.....	27,609.11	3,421.78	3,421.78	1,693.87	1,693.87
LANE COUNTY															
Grading, Sutton Lake-Florence	6.15	64,863.27	1,225.17	64,863.27	36,126.84	469.42	36,126.84	28,736.43	755.75	28,736.43	.....	.....	.....	301.98	7,345.03
Grading, West Unit, Lowell-Goodman Creek	3.92	64,000.00	50,673.70	50,673.70	44,000.00	2,803.71	2,803.71	20,000.00	47,869.99	47,869.99	.....	.....	.....	2,803.71	2,803.71
Grading, East Unit, Lowell-Goodman Creek	3.49	148,000.00	143,310.73	143,310.73	100,000.00	4,453.92	4,453.92	48,000.00	138,856.81	138,856.81	.....	.....	.....	4,453.92	4,453.92
Bridge over Deadwood Creek	.....	32,989.20	32,989.20	32,989.20	25,308.86	25,308.86	25,308.86	7,680.34	7,680.34	7,680.34	.....	.....	.....	2,226.10	2,226.10
Bridge over Blue River	.....	19,000.00	17,389.09	17,389.09	3,019.30	6,669.71	6,669.71	4,500.00	2,817.38	2,817.38	11,480.70	7,902.00	7,902.00	2,368.09	2,368.09
Bridge over Willamette River at Springfield	.....	146,000.00	104,923.80	104,923.80	Cr. 6,168.67	Cr. 3,277.22	Cr. 3,277.22	65,000.00	42,716.62	42,716.62	87,168.67	65,484.40	65,484.40	5,415.75	5,415.75
LANE AND LINN COUNTIES															
Paving, Harrisburg-Junction City	4.20	130,625.53	.....	130,625.53	49,181.57	Cr. 2,342.44	49,181.57	6,902.99	2,342.44	6,902.99	74,540.97	.....	74,540.97	.....	5,083.38
Bridge over Willamette River at Harrisburg	.....	201,176.64	16,886.78	201,176.64	Cr. 44,694.42	Cr. 50,077.28	Cr. 44,694.42	122,347.15	11,067.71	122,347.15	123,523.91	55,896.35	123,523.91	21.97	9,566.98
LINCOLN COUNTY															
Grading and surfacing, Eddyville-Toledo	17.20	182,079.95	.....	182,079.95	125,263.07	.....	141,263.07	56,816.88	.....	40,816.88	.....	.....	.....	.....	3,796.99
Surfacing, Otter Rock-Newport	3.60	59,619.47	2,540.16	59,619.47	59,619.47	2,540.16	59,619.47	.....	.....	.....	.....	.....	.....	19.57	3,439.93
Surfacing, Siletz Bay-Otter Rock	12.75	132,889.12	132,889.12	132,889.12	92,896.42	132,889.12	132,889.12	.....	.....	.....	39,992.70	.....	.....	5,862.64	5,862.64
Grading, Siletz Bay-Rocky Creek	8.97	169,574.54	12,910.23	169,574.54	61,971.44	Cr. 14,534.28	61,811.12	.....	.....	.....	107,603.10	27,444.51	107,763.42	399.12	8,459.11
Bridge over Siletz River	.....	119,977.65	22,016.69	119,977.65	53,644.35	Cr. 29,561.44	53,644.35	.....	.....	.....	66,333.30	51,578.13	66,333.30	1,097.00	6,123.02
Bridge over Yachats River	.....	23,034.42	7,829.47	23,034.42	18,034.42	2,829.47	18,034.42	5,000.00	5,000.00	5,000.00	.....	.....	.....	670.06	1,882.42
Bridge over Rocky Creek	.....	59,000.00	45,010.39	51,359.97	28,951.85	14,962.24	21,311.82	.....	.....	.....	30,048.15	30,048.15	30,048.15	1,779.38	3,429.63
Bridge over Depoe Bay	.....	55,557.09	17,533.71	55,557.09	23,134.59	Cr. 17,538.50	20,484.88	.....	.....	.....	32,422.50	35,072.21	35,072.21	1,164.43	3,187.63
LINN COUNTY															
Grading and surfacing, Albany-Lebanon (Mtn. States Power Co. cooperated $680.49, All paid during 1927-28)	12.56	112,359.33	.....	112,359.33	60,200.21	Cr. 2,310.25	60,200.21	51,478.63	1,629.76	51,478.63	.....	.....	.....	.....	9,402.06
Surfacing, Lebanon-Sheas Hill	17.24	120,000.00	8,274.60	8,274.60	64,000.00	704.54	704.54	56,000.00	7,570.06	7,570.06	.....	.....	.....	518.54	518.54
Grading, Lebanon-Sheas Hill (Logging Ry. cooperates $42,000. Paid $23,898.06 during 1927-28)	17.24	167,000.00	126,584.74	126,584.74	68,000.00	56,463.07	56,463.07	57,000.00	46,223.61	46,223.61	.....	.....	.....	9,930.17	9,930.17
Bridge over Wiley Creek	.....	16,727.73	16,727.73	16,727.73	8,950.66	8,950.66	8,950.66	7,777.07	7,777.07	7,777.07	.....	.....	.....	1,173.60	1,173.60
MALHEUR COUNTY															
Grading and surfacing, Weiser and Payette Spurs	3.56	32,556.66	1,730.80	32,556.66	32,556.66	1,730.80	32,556.66	.....	.....	.....	38,717.88	39,883.98	39,883.98	3,248.54	3,654.76
Surfacing, Ironside-Cow Valley	16.60	74,641.67	58,443.08	74,641.67	35,923.79	18,559.10	34,757.69	.....	.....	.....	22,364.10	.....	.....	2,489.30	5,226.46
Surfacing, Cow Valley-Brogan	6.10	41,262.52	41,262.52	41,262.52	18,898.42	41,262.52	41,262.52	.....	.....	.....	60,012.89	.....	60,012.89	.....	2,489.30
Grading, Beam Creek-Lost Valley	11.65	99,615.48	.....	99,615.48	28,971.34	Cr. 7,500.00	28,971.34	10,631.25	7,500.00	10,631.25	22,504.10	.....	22,504.10	.....	4,558.39
Grading, Lost Valley-Cow Valley	8.63	36,240.23	.....	36,240.23	Cr. 1,263.87	Cr. 15,000.00	Cr. 1,263.87	15,000.00	15,000.00	15,000.00	.....	.....	.....	.....	2,655.81
MORROW COUNTY															
Surfacing, Jones Hill-Lena	2.90	13,000.00	12,347.41	12,347.41	1,800.00	1,875.27	1,875.27	11,200.00	10,472.14	10,472.14	.....	.....	.....	1,258.34	1,258.34
Surfacing, Lena-Umatilla County Line	11.10	54,000.00	52,747.20	52,747.20	23,760.95	22,508.15	22,508.15	30,239.05	30,239.05	30,239.05	.....	.....	.....	3,541.83	3,541.83
Grading, Lena-Umatilla County Line	11.10	111,862.56	10,736.60	111,862.56	71,862.56	10,736.60	71,862.56	40,000.00	.....	40,000.00	.....	.....	.....	342.14	9,548.28

PROJECT	Miles of road	Total cost	Estimated cost of bridges
LANE COUNTY			
Cascade, Deer Creek-Hayes Hill	4.4	$ 54,000.00	$ 13,000.00
Cascade, Hayes Hill-Sisters Corner	10.1	77,000.00	17,000.00
Cascade, Redwood Junction-Wells Ranch	4.8	34,000.00	
Cascade, Cultus School-George Lemon	7.8	28,000.00	
Cascade, Goose Lemon-Deer Creek	3.3	17,000.00	
Sisters, Hayes Hill-Sisters Corner	4.3	30,000.00	7,000.00
Sisters, Deer Creek-Hayes Hill	4.4	34,000.00	7,000.00
Sisters, Cloverdale-Deer Creek	3.9	28,000.00	
Sisters, Sisters-Tumalo	11.7	87,000.00	20,000.00
Sisters, Deer Creek-Tumalo	8.4	60,000.00	14,000.00
Sisters, Sisters to City of Lakeview	1.5	12,000.00	
Sisters, Drews Valley-Lakeview	21.6	172,800.00	40,000.00
LAKE COUNTY			
Cascade, Deschutes County line-Chemult	15.5	124,000.00	31,000.00
Cascade, Bly-Fort Rock Highway	5.2	39,000.00	9,000.00
Cascade, Bly-Beatty	13.00	104,000.00	25,000.00
Cascade, Bly Mountain-Beatty	12.2	97,600.00	22,000.00
Lakeview-Alturas, Klamath Falls-Lakeview Road	5.3	42,400.00	10,000.00
Sprague River-Beatty, Forest Boundary	15.00	120,000.00	28,000.00
Sprague, Bly Mountain-Beatty	12.62	101,000.00	24,000.00
KLAMATH COUNTY			
Chiloquin over Allen Creek near Crater Lake Highway		5,000.00	2,000.00
Klamath Falls-Lakeview, Highway near Crater Lake Highway		34,000.00	8,000.00
Klamath, Chocktoot Creek-Brown Place		10,000.00	2,000.00
Klamath, Modoc Point-Odessa		5,000.00	1,000.00
Klamath, Algoma-Fort Klamath		60,000.00	14,000.00
Chiloquin, Chiloquin-Modoc Point	10.00	80,000.00	19,000.00
Chiloquin, Deer Creek-Hayes Hill	4.80	34,000.00	7,000.00
Chiloquin, Redwood Junction-Wells Ranch	4.8	34,000.00	7,000.00
Chiloquin, Chiloquin-Crater Lake Highway	7.8	55,000.00	13,000.00
Chiloquin, Goose Lemon-Deer Creek	3.3	17,000.00	
Sprague, Hayes Hill-Sisters Corner	10.1	77,000.00	17,000.00
Sprague, Deer Creek-Hayes Hill	4.4	34,000.00	7,000.00
Sprague, Cloverdale-Deer Creek	3.9	28,000.00	
Sprague, Chemult-Crescent	11.7	87,000.00	20,000.00
Sprague, Chiloquin-Crater Lake Highway	8.4	60,000.00	14,000.00
JOSEPHINE COUNTY			

Total pended by nty to Date	GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
.....	$	$	$	$ 943.06	$ 943.06
.....	.....	.....	.....	1,422.16	1,422.16
.....	22,578.60	11,440.80	11,440.80	2,301.98	2,301.98
.....	.....	.....	.....	126.32	126.32
62,524.63	168,394.36	.....	168,394.36	.....	53,710.74
.....	.....	.....	.....	.....	.....
23,901.14	29,301.07	29,301.07	29,301.07	746.83	3,041.33
6,000.00	9,794.84	.....	.....	1,027.75	1,027.75
.....	3,095.10	.....	.....	4,705.83	4,705.83
25,000.00	.....	.....	.....	.....	3,169.55
34,000.00	48,960.46	50,000.00	50,000.00	2,958.60	3,760.37
13,651.20	21,780.00	16,480.32	16,480.32	1,897.82	2,429.96
.....	52,439.40	41,750.13	41,750.13	4,977.01	5,206.96
.....	81,383.78	68,781.94	68,781.94	10,698.58	10,698.58
17,000.00	26,050.20	26,050.20	26,050.20	1,165.18	2,769.77
8,000.00	12,649.60	6,598.51	6,598.51	723.00	1,675.41
.....	.....	.....	.....	446.00	446.00
.....	.....	.....	.....	.....	724.66
.....	.....	.....	.....	1,299.68	1,299.68
.....	.....	.....	.....	136.57	136.57
71,160.44	.....	.....	.....	4,929.15	4,929.15
19,862.33	33,600.16	.....	33,600.16	.....	3,268.89
.....	20,281.80	2,487.63	20,281.80	.....	2,045.62
58,164.49	15,000.00	.....	15,000.00	.....	34,515.69
16,250.00	.....	.....	.....	269.44	1,645.79
37,001.86	63,910.58	.....	63,910.58	.....	6,320.29
32,584.25	.....	.....	.....	.....	4,124.29
4,499.64	10,407.00	.....	10,407.00	.....	1,949.68
8,487.25	67,484.39	.....	.....	4,053.30	4,053.30
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
5,000.00	47,143.80	36,765.84	36,765.84	8,169.74	8,169.74
.....	22,241.92	.....	22,241.92	.....	2,202.67
38,476.71	$3,275,657.64	$1,426,210.31	$2,853,148.87	$ 265,970.91	$ 654,344.43

PROJECT	Miles in Project	Total Cost	Total Cost per Mile
MONTEREY COUNTY			
Southern Pacific Railroad-Castroville	2.00	$ 60,000.00	$ 30,000
Southern Pacific Railroad-Chualar Creek	11.10	84,000.00	7,568
Southern Pacific Railroad-Chualar Creek	11.10	83,538,111.88	7,525
MORROW COUNTY			
Southern Pacific Railroad-Cow Canyon	2.83	85,840.53	
Southern Pacific Railroad-Cow Canyon	1.63	84,612.88	
Southern Pacific Railroad-Cow Canyon	1.30	41,362.25	31,816
Southern Pacific Railroad-Rhea Creek	2.83	74,141.81	26,200
Southern Pacific Railroad-Rhea Creek	2.23	59,284.00	26,600
MAGHEUR COUNTY			
Bridge over Willow Creek		81,781.25	1,181.25
(Logging Ry. cooperated $18,000 Bond Issue) $53,858.30 during 1931-32)			
Southern Pacific Railroad-Spring Hill	17.84	180,000.00	10,089
Gr. Nor. Railway-Spring Hill	42.71	681,000.00	15,941
(Main Stayton Power Co. cooperated $880.45 All load during 1931-32)			
Stayton and Scotts Mills-Alpine-Lebanon	18.28	115,320.53	
LINN COUNTY			
Bridge over Tyee Bay		52,760.00	1,172.44
Bridge over Rocky Creek		53,000.00	1,819.00
Bridge over Arcadia River		11 53.00	1,782.7
Bridge over Shedd Hwy.		11 16.00	1,818.00
Corvallis, Shedd Hwy-Rocky Creek	2.00	131,134.24	65,567.00
Southern Pacific Railroad-Shedd Hwy-Outer Road	11.10	111,838.00	10,076.00
Southern Pacific Railroad-Albany	2.80	28,013.42	
Corvallis and Eastern Railroad-Corvallis-Toledo	11.10	28,870.82	
LINCOLN COUNTY			
Bridge over Willamette River at Harrisburg	1.50	18,000.00	12,000.00
Travers, Harrisburg-Junction City	4.50	28,259,081.23	
LANE AND LINN COUNTIES			
Bridge over Willamette River at Harrisburg		00,000,81	
Bridge over Long Tom River		00,000,61	11,000.00
Bridge over Long Tom River		05,886,33	05,000.00
Corvallis, Coast Line Tower-Goodnight Creek	2.43	00,000,42	111,000.00
Corvallis, Coast Line Tower-Goodnight Creek	1.05	00,000,81	11,000.00
Bridges over Willamette River at Harrisburg		00,000,81	1,000.00
Travers, Harrisburg-Junction City	4.50	28,259,081.23	10,000.00
LAKE COUNTY			
Southern Pacific Railroad-Drews Valley-Lakeview	10.10	31,272,37	12,000.00
Corvallis, Coast Line Crossing-Harrisburg		15,000.00	1,000.00
Corvallis, Coast Line Crossing-Harrisburg	1.42	28,000.00	12,000.00
Southern Pacific Railroad-Eugene	2.00	00,000,12	11,000.00
Corvallis, Elk-Drews Intersection	11.00	25,000.00	2,000.00
Corvallis, Coast Line Crossing-Harrisburg	1.42	28,000.00	12,000.00
Southern Pacific Railroad-Eugene	2.00	00,000,12	11,000.00
Corvallis, Elk-Drews Intersection	11.00	25,000.00	2,000.00
KLAMATH COUNTY			
Bridges on Redwood Highway near Grants Pass		10,306.25	34,306.25
Bridges, George Branch-Deer Creek		15,111.00	1,000.00
Bridges, Redwood and Oregon Caves Highway		00,111,22	1,000.00
Corvallis, Coast Line-Shedd Junction	1.50	25,000.00	11,000.00
Corvallis, Coast Line-Harper Hill	4.50	68,647.25	11,000.00
Corvallis, Redwood Junction-George Branch	2.00	83,544.36	11,000.00
Corvallis, Corvallis Eastern-George Branch	2.00	83,544.36	11,000.00
Corvallis, Coast Line-Deer Creek	4.00	67,000.00	11,000.00
Southern Pacific Railroad-Harper Hill	1.00	11,000.00	11,000.00
Southern Pacific Railroad-George Branch-Deer Creek	2.00	31,000.00	11,000.00
Southern Pacific Railroad-Deer Creek-Harper Hill	1.00	11,000.00	11,000.00
Southern Pacific Railroad-Redwood Jct.-Grayback Creek	2.00	31,000.00	11,000.00
TORRELINNE COUNTY			
Southern Pacific Railroad-Alsea School-George Branch	2.00	00,000,12	11,000.00

TABLE IX—Continued

PROJECT	Length in Miles	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE COOPERATION: State Share of Cost	STATE COOPERATION: Expended by State During 1927 and 1928	STATE COOPERATION: Total Expended by State to Date	COUNTY COOPERATION: County Share of Cost	COUNTY COOPERATION: Expended by County During 1927 and 1928	COUNTY COOPERATION: Total Expended by County to Date	GOVERNMENT COOPERATION: Government Share of Cost	GOVERNMENT COOPERATION: Expended by Government During 1927 and 1928	GOVERNMENT COOPERATION: Total Expended by Government to Date	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Cost During 1927 and 1928	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Total Cost to Date
POLK COUNTY															
Grading and surfacing, Valley Junction Bridge approaches	.....	$ 14,879.56	$ 14,879.56	$ 14,879.56	14,879.56	$ 14,879.56	$ 14,879.56	$	$	$	$	$	$	$ 943.06	$ 943.06
Bridge over Yamhill River at Valley Junction	.....	18,584.87	18,584.87	18,584.87	18,584.87	18,584.87	18,584.87	.....	.....	.....	.....	.....	.....	1,422.16	1,422.16
Bridge over Luckiamute River	.....	39,000.00	32,319.45	32,319.45	16,421.40	20,878.65	20,878.65	.....	.....	.....	22,578.60	11,440.80	11,440.80	2,301.98	2,301.98
Culvert over Ash Creek	.....	3,000.00	2,409.68	2,409.68	3,000.00	2,409.68	2,409.68	.....	.....	.....	.....	.....	.....	126.32	126.32
Projects completed prior to 1927	.....	926,738.35	.....	926,738.35	589,356.33	.....	695,819.36	168,987.66	.....	62,524.63	168,394.36	.....	168,394.36	.....	53,710.74
TILLAMOOK COUNTY															
Materials for paving Moore Cut-off	.....	4,300.00	4,300.00	4,300.00	4,300.00	4,300.00	4,300.00	.....	.....	.....	.....	.....	.....	.....	.....
Grading and surfacing, Wheeler Section	1.63	64,244.00	14,215.21	64,244.00	11,041.79	Cr. 23,987.00	11,041.79	23,901.14	8,901.14	23,901.14	29,301.07	29,301.07	29,301.07	746.83	3,041.33
Surfacing, Garibaldi-Hobsonville	3.60	20,900.60	20,900.60	20,900.60	5,105.76	14,900.60	14,900.60	6,000.00	6,000.00	6,000.00	9,734.84	.....	.....	1,027.75	1,027.75
Surfacing, Mohler-Garibaldi	2.70	136,000.00	120,340.50	120,340.50	98,104.90	120,340.50	120,340.50	34,800.00	.....	.....	3,095.10	.....	.....	4,705.83	4,705.83
Grading, Jetty Creek-Brighton	1.00	78,000.00	1,394.42	76,491.07	53,000.00	1,394.42	51,491.07	25,000.00	.....	25,000.00	.....	.....	.....	.....	3,169.55
Grading, Garibaldi-Hobsonville	3.23	98,661.56	75,272.40	98,661.56	5,701.10	Cr. 8,727.60	14,661.56	34,000.00	34,000.00	34,000.00	48,960.46	50,000.00	50,000.00	2,958.60	3,760.37
(S. P. Co. cooperates $10,000. Nothing paid to date)															
Grading, Mohler-Wheeler	1.30	45,648.65	34,730.74	45,648.65											
Grading, Wheeler-Brighton	2.86	161,471.88	161,241.93	161,471.88	10,217.45	4,599.22	15,517.13	13,651.20	13,651.20	13,651.20	21,780.00	16,480.32	16,480.32	1,897.82	2,429.96
Grading, Rockaway-Garibaldi	4.36	230,000.00	207,981.31	207,981.31	51,032.48	119,491.80	119,721.75	58,000.00	.....	.....	52,439.40	41,750.13	41,750.13	4,977.01	5,206.96
Bridge over Nehalem River at Mohler	.....	51,947.13	29,240.06	51,947.13	78,616.22	139,199.37	139,199.37	70,000.00	.....	.....	81,383.78	68,781.94	68,781.94	10,698.58	10,698.58
Bridge over Miami River	.....	22,622.04	8,998.86	22,622.04	8,896.93	Cr. 3,810.14	8,896.93	17,000.00	7,000.00	17,000.00	26,050.20	26,050.20	26,050.20	1,165.18	2,769.77
Bridge over Christensen Slough	.....	5,211.70	5,211.70	5,211.70	1,972.44	Cr. 5,599.65	8,023.53	8,000.00	8,000.00	8,000.00	12,649.60	6,598.51	6,598.51	723.00	1,675.41
					5,211.70	5,211.70	5,211.70	.....	.....	.....	.....	.....	.....	446.00	446.00
UMATILLA COUNTY															
Surfacing, Meacham Section	0.66	8,646.08	223.22	8,646.08											724.66
Surfacing, Morrow County Line-Vinson	4.00	17,000.00	16,400.35	16,400.35	8,646.08	223.22	8,646.08	.....	.....	.....	.....	.....	.....	.....	1,299.68
Prospecting for surfacing materials, Lazinka Ranch-Albee	.....	451.93	451.93	451.93	17,000.00	16,400.35	16,400.35	.....	.....	.....	.....	.....	.....	1,299.68	1,299.68
Grading, South Unit Lazinka Ranch-Albee	6.00	82,000.00	76,089.59	76,089.59	451.93	451.93	451.93	.....	.....	.....	.....	.....	.....	136.57	136.57
Bridge over Umatilla River at Umatilla	.....	52,995.61	70.89	52,995.61	5,000.00	4,929.15	4,929.15	77,000.00	71,160.44	71,160.44	.....	.....	.....	4,929.15	4,929.15
Meacham Overcrossing	.....	35,186.36	.....	35,186.36	Cr. 466.88	70.89	Cr. 466.88	19,862.33	.....	19,862.33	33,600.16	.....	33,600.16	.....	3,268.89
(O. W. R. & N. Co. cooperates $12,381.98. All paid during 1927-28)					2,522.58	Cr. 14,869.61	2,522.58	.....	.....	.....	20,281.80	2,487.63	20,281.80	.....	2,045.62
UNION COUNTY															
Projects completed prior to 1927	.....	561,225.29	.....	561,225.29	210,033.26	.....	413,614.53	261,745.76	.....	58,164.49	15,000.00	.....	15,000.00	.....	34,515.69
(O. W. R. & N. Co. cooperates $74,446.27. All paid prior to 1927)															
WALLOWA COUNTY															
Surfacing, Unit 1, Enterprise-Forest Bdry	7.59	34,424.36	13,313.34	34,424.36	18,174.36	258.19	18,174.36	16,250.00	13,055.15	16,250.00	.....	.....	.....	269.44	1,645.79
Grading and surfacing, Lostine-Enterprise	7.89	116,797.60	.....	116,797.60	Cr. 2,188.38	Cr. 1,118.50	15,885.16	55,075.40	1,118.50	37,001.86	63,910.58	.....	63,910.58	.....	6,320.29
Grading and surfacing, Unit 2, Enterprise-Forest Bdry	6.05	82,922.58	.....	82,922.58	43,523.44	.....	50,338.33	39,399.14	.....	32,584.25	.....	.....	.....	.....	4,124.29
Bridges, Lostine-Enterprise	.....	21,505.62	.....	21,505.62	1,320.65	.....	6,598.98	9,777.97	.....	4,499.64	10,407.00	.....	10,407.00	.....	1,949.68
WASCO COUNTY															
Bridge over Deschutes River at Maupin	.....	109,000.00	21,044.68	21,044.68	Cr. 8,484.39	12,557.43	12,557.43	50,000.00	8,487.25	8,487.25	67,484.39	.....	.....	4,053.30	4,053.30
Surfacing materials for Deschutes River Bridge approaches	.....	4,860.00	4,860.00	4,860.00	4,860.00	4,860.00	4,860.00	.....	.....	.....	.....	.....	.....	.....	.....
WASHINGTON COUNTY															
Bridge over Fanno Creek	.....	3,000.00	160.29	160.29	3,000.00	160.29	160.29	.....	.....	.....	.....	.....	.....	.....	.....
WHEELER COUNTY															
Grading, Mitchell-Keyes Creek Summit	7.48	86,000.00	68,656.25	68,656.25	23,856.20	26,890.41	26,890.41	15,000.00	5,000.00	5,000.00	47,143.80	36,765.84	36,765.84	8,169.74	8,169.74
YAMHILL COUNTY															
Paving, St. Joseph Section	1.19	38,534.04	484.19	38,534.04	16,292.12	484.19	16,292.12	.....	.....	.....	22,241.92	.....	22,241.92	.....	2,202.67
Totals		$12,190,718.60	$ 4,703,533.81	$11,497,759.73	$5,859,334.39	$1,899,988.19	$6,276,190.01	$2,797,680.49	$1,294,805.17	$2,138,476.71	$3,275,657.64	$1,426,210.31	$2,853,148.87	$ 265,970.91	$ 654,344.43

SUMMARY

Cooperating Parties	Estimated Cooperative Shares	Expended Prior to Dec. 1, 1926	Expended Dec. 1, 1926, to Nov. 30, 1928	Total Expended to Date	Estimated Cost to Complete
State	$ 5,859,334.39	$4,376,201.82	$1,899,988.19	$ 6,276,190.01	$Cr.416,855.62
Counties	2,797,680.49	843,671.54	1,294,805.17	2,138,476.71	659,203.78
Federal government	3,275,657.64	1,426,938.56	1,426,210.31	2,853,148.87	422,508.77
Misc. contributors	258,046.08	147,414.00	82,530.14	229,944.14	28,101.94
Totals	$12,190,718.60	$6,794,225.92	$4,703,533.81	$11,497,759.73	$ 692,958.87

Location	Project Purpose	Principal Contractor Engineer	Date Contract Awarded	Date Project to be Completed	Total Contract Amount
Bridge over Grand River at Marshall	Bridge Replacement	Ralph Construction Co.	1-15-85	12-31-85	$ 1,250,000.00
Bridge over Flat River at Greenville

o NOVEMBER 30, 1928

h have previously been constructed under the supervision of the State

Total nded by ty to Date	GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Expended During 1927 and 1928	Total Expended to Date
.....	$	$	$	$ 218.12	$ 218.12
.....	.....	.....	.....	104.51	104.51
.....	.....	.....	.....	49.83	1,584.52
.....	75,128.03	48,041.63	48,041.63	8,203.03	8,203.03
.....	.....	.....	.....	396.00	396.00
.....	157,813.08	79,038.59	157,813.08	3,126.23	15,345.44
.....	.....	.....	.....	1.00	1.00
.....	13,021.80	13,021.80	13,021.80	2,349.80	2,349.80
.....	3,163.09	2,698.64	2,698.64	942.96	942.96
.....	.....	.....	.....	49.03	49.03
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
2,500.00	.....	.....	.....	.....	.....
.....	.....	.....	.....	1,537.85	1,537.85
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	439.44	439.44
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	440.32	440.32
.....	.....	.....	.....	10.00	78.45
.....	.....	.....	.....	1,287.43	1,287.43
.....	.....	.....	.....	.....	.....

TABLE X

EXPENDITURES FOR MAJOR ADDITIONS AND MAJOR BETTERMENT WORK—DECEMBER 1, 1926, to NOVEMBER 30, 1928

In this table are listed the expenditures made on those construction jobs which have to do with the improvement and betterment of sections of highway which have previously been constructed under the supervision of the State Highway Commission.

PROJECT	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE COOPERATION			COUNTY COOPERATION			GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
				State Share of Cost	Expended by State During 1927 and 1928	Total Expended by State to Date	County Share of Cost	Expended by County During 1927 and 1928	Total Expended by County to Date	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Expended During 1927 and 1928	Total Expended to Date
BENTON COUNTY														
Pile revetment near Corvallis	$ 8,024.98	$ 8,024.98	$ 8,024.98	$ 8,024.98	$ 8,024.98	$ 8,024.98	$	$	$	$	$	$	$ 218.12	$ 218.12
BENTON AND LINCOLN COUNTIES														
Widening roadbed, Eddyville-Blodgett	35,045.80	19,730.46	35,045.80	35,045.80	19,730.46	35,045.80	.....	.....	.....	.....	.....	.....	104.51	104.51
CLACKAMAS COUNTY														
Widening roadbed, Canby-Aurora	18,635.24	2,717.69	18,635.24	18,635.24	2,717.69	18,635.24	.....	.....	.....	.....	.....	.....	49.83	1,584.52
Widening roadbed, Canemah-New Era	160,000.00	115,421.34	115,421.34	84,871.97	67,379.71	67,379.71	.....	.....	.....	75,128.03	48,041.63	48,041.63	8,203.03	8,203.03
CLATSOP COUNTY														
Pavement widening, Miles Crossing Section	2,899.50	2,899.50	2,899.50	2,899.50	2,899.50	2,899.50	.....	.....	.....	.....	.....	.....	396.00	396.00
Paving, Astoria-Svensen	384,579.39	110,794.77	384,579.39	226,766.31	31,756.18	226,766.31	.....	.....	.....	157,813.08	79,038.59	157,813.08	3,126.23	15,345.44
Grading and surfacing, Soapstone Creek Bridge Approaches	5,852.65	5,852.65	5,852.65	5,852.65	5,852.65	5,852.65	.....	.....	.....	.....	.....	.....	1.00	1.00
Bridge over Soapstone Creek	25,877.37	25,877.37	25,877.37	12,855.57	12,855.57	12,855.57	.....	.....	.....	13,021.80	13,021.80	13,021.80	2,349.30	2,349.30
Rock Creek and Big Noise Creek Culverts	10,152.11	10,152.11	10,152.11	6,989.02	7,453.47	7,453.47	.....	.....	.....	3,163.09	2,698.64	2,698.64	942.96	942.96
COLUMBIA COUNTY														
Bridge over Fall Creek	2,500.00	2,108.20	2,108.20	2,500.00	2,108.20	2,108.20	.....	.....	.....	.....	.....	.....	49.03	49.03
COOS COUNTY														
Betterment materials, Coquille-Riverton	14,040.00	14,040.00	14,040.00	14,040.00	14,040.00	14,040.00	.....	.....	.....	.....	.....	.....	.....	.....
Betterment materials, Myrtle Point-Endicott Creek	14,040.00	14,040.00	14,040.00	14,040.00	14,040.00	14,040.00	.....	.....	.....	.....	.....	.....	.....	.....
Fill on Front Street, Coquille	6,730.35	681.87	6,730.35	4,230.35	Cr. 1,818.13	4,230.35	2,500.00	2,500.00	2,500.00	.....	.....	.....	.....	.....
DOUGLAS COUNTY														
Bridges over Canyon Creek	14,605.31	14,605.31	14,605.31	14,605.31	14,605.31	14,605.31	.....	.....	.....	.....	.....	.....	1,537.85	1,537.85
HOOD RIVER COUNTY														
Betterment materials, Blue Bucket Section	6,988.60	6,988.60	6,988.60	6,988.60	6,988.60	6,988.60	.....	.....	.....	.....	.....	.....	.....	.....
JACKSON COUNTY														
Betterment materials, Prospect-Park Boundary	27,300.00	27,300.00	27,300.00	27,300.00	27,300.00	27,300.00	.....	.....	.....	.....	.....	.....	.....	.....
JEFFERSON COUNTY														
Grading, Metolius Cut-off	4,129.13	4,129.13	4,129.13	4,129.13	4,129.13	4,129.13	.....	.....	.....	.....	.....	.....	439.44	439.44
KLAMATH COUNTY														
Betterment materials, Klamath Falls-Merrill-Olene	52,000.00	36,441.76	36,441.76	52,000.00	36,441.76	36,441.76	.....	.....	.....	.....	.....	.....	.....	.....
Betterment materials, Sand Creek Section	21,000.00	.....	.....	21,000.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Betterment materials, Keno-Klamath Falls	25,000.00	8,231.45	8,231.45	25,000.00	8,231.45	8,231.45	.....	.....	.....	.....	.....	.....	.....	.....
LANE COUNTY														
Betterment materials, Low Pass-Cheshire	11,012.00	11,012.00	11,012.00	11,012.00	11,012.00	11,012.00	.....	.....	.....	.....	.....	.....	.....	.....
LINCOLN COUNTY														
Power equipment for Siletz River Bridge	6,322.54	6,322.54	6,322.54	6,322.54	6,322.54	6,322.54	.....	.....	.....	.....	.....	.....	440.32	440.32
LINN COUNTY														
Bank Protection, Santiam River near Jefferson (S. P. Co. cooperates $13,275.64. Paid $9,937.37 prior to 1927 and $3,075.33 during 1927-28.)	26,818.07	7,378.47	26,818.07	13,542.43	4,303.14	13,805.37	.....	.....	.....	.....	.....	.....	10.00	78.45
MARION AND POLK COUNTIES														
Concrete deck for Salem Bridge	25,280.81	25,280.81	25,280.81	25,280.81	25,280.81	25,280.81	.....	.....	.....	.....	.....	.....	1,287.43	1,287.43
MORROW AND UMATILLA COUNTIES														
Betterment materials, Arlington-Pendleton Section	15,000.00	12,732.00	12,732.00	15,000.00	12,732.00	12,732.00	.....	.....	.....	.....	.....	.....	.....	.....

MORROW AND UMATILLA COUNTIES		
Replacement materials, Athena-Weston section	$12,000.00	$12,000.00
MARION AND POLK COUNTIES		
Concrete deck for Salem Bridge	$32,320.81	$32,320.81
LINN COUNTY		
Bank Protection, Santiam River near Tangent (S. P. Co. cooperates $12,372.64. Paid $3,891.21 prior to 1951 and $8,012.33 during 1951-53.)	$16,818.01	$16,818.01
LINCOLN COUNTY		
Power equipment for Siletz River Bridge	$ 6,355.24	$ 6,355.24
LANE COUNTY		
Betterment materials, Low Level-Cheadle	$11,015.00	$11,015.00
Betterment materials, Kemo-Klamath Falls	$22,000.00	$ 22,000.00
Betterment materials, Sand Creek Section	$31,000.00	
Betterment materials, Klamath Falls-Worden-Olene	$25,000.00	$ 38,444.10
KLAMATH COUNTY		
Cheadle, Microbus Cut-off	$11,158.13	$11,158.13
JEFFERSON COUNTY		
Betterment materials, Terrebert-Perry Boundary	$75,800.00	$ 75,800.00
JACKSON COUNTY		
Betterment materials, Blue Bucket section	$ 6,388.60	$ 6,388.60
HOOD RIVER COUNTY		
Bridges over Canyon Creek	$14,602.31	$ 14,602.31
DOUGLAS COUNTY		
Fill on Trent Street, Coquille	$ 2,270.32	$ 2,270.32
Betterment materials, Myrtle Point-Empire Creek	$14,040.00	$ 14,040.00
Betterment materials, Coquille-Empire	$14,040.00	$ 14,040.00
COOS COUNTY		
Bridge over Fall Creek	$ 6,200.00	$ 6,801.20
COLUMBIA COUNTY		
Rock Cover and Fix Holes Creek Culverts	$10,151.11	$ 10,151.11
Bridge over Bottomless Creek	$ 12,772.22	$ 12,772.22
Culvert and Antiscour Protection Creek Bridge	$ 2,252.20	$ 2,252.20
Paving, Yaquina-Siletz	$ 65,213.34	$ 71,467.11
Pavement widening, Pilot Crossing Section	$ 2,200.20	$ 2,200.20
CLATSOP COUNTY		
Widening roadbed, Carnahan-New Era	$150,000.00	$ 112,154.11
Widening roadbed, Camp-Antoria	$ 18,632.34	$ 3,171.63
CLACKAMAS COUNTY		
Widening roadbed, Eddyville-Blodgett	$ 32,042.08	$ 18,130.46
BENTON AND LINCOLN COUNTIES		
Fog movement test Corvallis	$ 8,634.20	$ 8,634.20
BENTON COUNTY		
	TOTAL	
	Estimated Total Cost	Expended Prior to July 1, 1953

Highway Commission.

EXPENDITURES FOR MAIN

Total ended by ty to Date	GOVERNMENT COOPERATION			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Expended During 1927 and 1928	Total Expended to Date
.....	$	$	$	$ 823.70	$ 823.70
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1,815.83	2,987.11
.....	.....	.....	.....	148.21	148.21
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	8,478.61
.....	84,791.52	84,791.52	84,791.52	.....	
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
5,000.00	.....	.....	.....	5,149.39	5,149.39
.....	4,625.71	.....	.....	.....	.....
7,500.00	$ 338,543.23	$ 227,592.18	$ 306,366.67	$ 27,092.68	$ 50,564.92

TABLE X—Continued

PROJECT	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE COOPERATION: State Share of Cost	STATE COOPERATION: Expended by State During 1927 and 1928	STATE COOPERATION: Total Expended by State to Date	COUNTY COOPERATION: County Share of Cost	COUNTY COOPERATION: Expended by County During 1927 and 1928	COUNTY COOPERATION: Total Expended by County to Date	GOVERNMENT COOPERATION: Government Share of Cost	GOVERNMENT COOPERATION: Expended by Government During 1927 and 1928	GOVERNMENT COOPERATION: Total Expended by Government to Date	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Expended During 1927 and 1928	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Total Expended to Date
POLK COUNTY														
Grading and surfacing, Holmes Gap Section	$ 7,399.93	$ 7,399.93	$ 7,399.93	$ 7,399.93	$ 7,399.93	$ 7,399.93	$	$	$	$	$	$	$ 823.70	$ 823.70
Betterment materials, Grande Ronde-Sheridan (Valley Junction)	5,500.00	3,380.00	3,380.00	5,500.00	3,380.00	3,380.00	.....	.....	.....	.....	.....	.....	.....	.....
SHERMAN COUNTY														
Reconstruction, John Day River Bridge	50,363.46	42,604.71	50,363.46	50,363.46	42,604.71	50,363.46	.....	.....	.....	.....	.....	.....	1,815.83	2,987.11
Grading approaches to John Day River Bridge	1,632.75	1,632.75	1,632.75	1,632.75	1,632.75	1,632.75	.....	.....	.....	.....	.....	.....	148.21	148.21
TILLAMOOK COUNTY														
Betterment materials, Hebo-Cloverdale	6,750.00	5,750.00	5,750.00	6,750.00	5,750.00	5,750.00	.....	.....	.....	.....	.....	.....	.....	.....
UMATILLA COUNTY														
Betterment materials, Pilot Rock-Freewater (B)	3,000.00	.....	.....	3,000.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Betterment materials, West unit, Pendleton-Kamela	15,925.00	15,925.00	15,925.00	15,925.00	15,925.00	15,925.00	.....	.....	.....	.....	.....	.....	.....	.....
Betterment materials, East unit, Pendleton-Kamela	12,000.00	6,323.30	6,323.30	12,000.00	6,323.30	6,323.30	.....	.....	.....	.....	.....	.....	.....	.....
Widening roadbed Emigrant Hill Section	107,868.37	.....	107,868.37	23,076.85	Cr. 84,791.52	23,076.85	.....	.....	.....	84,791.52	84,791.52	84,791.52	.....	8,478.61
WASCO COUNTY														
Betterment materials, Maupin-South	1,485.00	1,485.00	1,485.00	1,485.00	1,485.00	1,485.00	.....	.....	.....	.....	.....	.....	.....	.....
Betterment materials, Maupin-North	9,570.00	9,570.00	9,570.00	9,570.00	9,570.00	9,570.00	.....	.....	.....	.....	.....	.....	.....	.....
WASHINGTON COUNTY														
Grading, Multnomah County Line-Beaverton	80,000.00	73,487.01	73,487.01	75,000.00	68,487.01	68,487.01	5,000.00	5,000.00	5,000.00	.....	.....	.....	5,149.39	5,149.39
YAMHILL COUNTY														
Bridge over Agency Creek	7,500.00	.....	.....	2,874.29	.....	.....	.....	.....	.....	4,625.71	.....	.....	.....	.....
Totals	$1,232,828.36	$ 660,320.71	$1,106,453.42	$ 873,509.49	$ 422,153.20	$ 779,574.05	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 338,543.23	$ 227,592.18	$ 306,366.67	$ 27,092.68	$ 50,564.92

SUMMARY

Cooperating Parties	Estimated Cooperative Shares	Expended Prior to Dec. 1, 1926	Expended Dec. 1, 1926, to Nov. 30, 1928	Total Expended to Date	Cost to Complete
State	$ 873,509.49	$ 357,420.85	$ 422,153.20	$ 779,574.05	$ 93,935.44
County	7,500.00	.....	7,500.00	7,500.00	.....
Federal government	338,543.23	78,774.49	227,592.18	306,366.67	32,176.56
Miscellaneous contributors	13,275.64	9,937.37	3,075.33	13,012.70	262.94
Totals	$1,232,828.36	$ 446,132.71	$ 660,320.71	$1,106,453.42	$ 126,374.94

TABLE I—Continued

[illegible]

SUMMARY

Operating Parties	Estimated Cooperative Budget	Expended Prior to Dec. 1, 1926	Expended Dec. 1, 1926 to Nov. 30, 1928	Total Expended to Date	Cost to Complete
State	$ 873,599.49	$ 337,420.86	$ 423,163.20	$ 779,574.06	$ 93,935.44
County	7,600.00	....	7,500.00	7,500.00	....
Federal	333,543.23	73,774.49	227,592.18	303,366.67	32,176.56
Miscell.	12,275.64	9,937.37	3,075.33	13,012.70	262.94
Total	$1,232,828.36	$ 445,132.71	$ 660,320.71	$1,106,453.42	$ 126,374.94

nstructed under the supervi-

tal ded by nment Date	CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Cost During 1927 and 1928	Total Cost to Date
.....	$ 770.04	$ 1,174.09
.....	2,017.75	2,017.75
.....	666.06	666.06
.....	1,427.96	1,542.49
.....	.....	.....
.....	753.17	753.17
.....	2,185.56	2,185.56
.....	714.67	714.67
.....	274.18	274.18
.....	1,157.57	1,157.57
.....	2,058.66	2,058.66
.....	.....	.....
.....	.....	.....
.....	10.00	10.00
.....	855.35	855.35
.....	1,638.29	1,638.29
.....	.....	.....
.....	230.75	230.75
.....	1,233.94	1,233.94
.....	5,087.46	5,087.46
.....	1,467.15	1,467.15
.....	2,432.75	2,432.75
.....	885.05	885.05
.....	1,416.00	1,416.00
.....	11.77	490.12
.....	1,128.64	1,154.94
.....	3,766.59	3,766.59
.....	1,625.32	1,625.32
.....	441.90	441.90
.....	1,378.66	1,378.66
.....	903.13	903.13

TABLE X—Continued

SUMMARY

Source of Funds	Estimated Participating Shares	Expended Prior to Dec. 1, 1926	Expended Dec. 1, 1926 to Nov. 30, 1928	Total Expended to Date	Cost to Complete
State	$ 873,569.49	$ 337,430.86	$ 433,163.20	$ 779,574.06	$ 93,935.44
County	7,[illegible]		[illegible]	7,[illegible]	
Federal Government	333,543.23	76,774.49	297,592.18	306,366.67	32,176.56
Miscell. contributors	13,275.64	9,937.37	3,075.33	13,012.70	262.94
Totals	$1,232,828.36	$ 446,142.71	$ 669,320.71	$1,106,463.42	$ 126,374.94

TABLE XI

EXPENDITURES FOR SPECIAL MAINTENANCE WORK—DECEMBER 1, 1926, TO NOVEMBER 30, 1928

In this table are listed the expenditures on those projects which have to do with the repair and upkeep of sections of highway which have previously been constructed under the supervision of the State Highway Commission.

PROJECT	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE FUNDS			GOVERNMENT FUNDS			CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
				State Share of Cost	Expended by State During 1927 and 1928	Total Expended by State to Date	Government Share of Cost	Expended by Government During 1927 and 1928	Total Expended by Government to Date	Cost During 1927 and 1928	Total Cost to Date
BAKER AND MALHEUR COUNTIES											
Maintenance materials, Baker-Ontario	$ 35,006.15	$ 18,056.74	$ 35,006.15	$ 35,006.15	$ 18,056.74	$ 35,006.15	$	$	$	$ 770.04	$ 1,174.09
BAKER AND UNION COUNTIES											
Maintenance materials, La Grande-Baker	55,539.94	55,539.94	55,539.94	55,539.94	55,539.94	55,539.94	.....	.....	.....	2,017.75	2,017.75
BENTON COUNTY											
Resurfacing, Alsea Mountain Section	29,407.97	29,407.97	29,407.97	29,407.97	29,407.97	29,407.97	.....	.....	.....	666.06	666.06
BENTON AND LINCOLN COUNTIES											
Resurfacing, East Unit, Eddyville-Blodgett	62,000.00	58,174.57	59,589.10	62,000.00	58,174.57	59,589.10	.....	.....	.....	1,427.96	1,542.49
Maintenance materials, Missouri Bend Section	3,302.00	3,302.00	3,302.00	3,302.00	3,302.00	3,302.00	.....	.....	.....	.....	.....
CLACKAMAS COUNTY											
Maintenance materials, Multnomah County Line-Beaver Creek	19,623.34	19,623.34	19,623.34	19,623.34	19,623.34	19,623.34	.....	.....	.....	753.17	753.17
Maintenance materials, Beaver Creek-Rhododendron	43,095.82	43,095.82	43,095.82	43,095.82	43,095.82	43,095.82	.....	.....	.....	2,135.56	2,135.56
CLATSOP COUNTY											
Maintenance materials, Seaside-Jack Horner Creek	30,137.55	30,137.55	30,137.55	30,137.55	30,137.55	30,137.55	.....	.....	.....	714.67	714.67
Maintenance materials, Hamlet Junction-Tillamook County Line	6,409.41	6,409.41	6,409.41	6,409.41	6,409.41	6,409.41	.....	.....	.....	274.18	274.18
CLATSOP AND TILLAMOOK COUNTIES											
Maintenance materials, Jack Horner Creek-Mohler	25,433.27	25,433.27	25,433.27	25,433.27	25,433.27	25,433.27	.....	.....	.....	1,157.57	1,157.57
COOS COUNTY											
Resurfacing and maintenance materials, Riverton-Coquille-Hoffman Bridge	87,000.00	11,632.69	11,632.69	87,000.00	11,632.69	11,632.69	.....	.....	.....	2,058.66	2,058.66
CURRY COUNTY											
Maintenance materials, Euchre Creek-Rogue River	1,982.33	1,982.33	1,982.33	1,982.33	1,982.33	1,982.33	.....	.....	.....	.....	.....
DESCHUTES COUNTY											
Maintenance materials, Lava Butte-Lapine	3,467.55	3,467.55	3,467.55	3,467.55	3,467.55	3,467.55	.....	.....	.....	.....	.....
Maintenance materials, Redmond Section	15,067.32	15,067.32	15,067.32	15,067.32	15,067.32	15,067.32	.....	.....	.....	10.00	10.00
DOUGLAS COUNTY											
Maintenance materials, Mystic Creek-Winston	24,482.95	24,482.95	24,482.95	24,482.95	24,482.95	24,482.95	.....	.....	.....	855.35	855.35
GILLIAM COUNTY											
Resurfacing and maintenance materials, Arlington-Shutler Creek	27,213.94	27,213.94	27,213.94	27,213.94	27,213.94	27,213.94	.....	.....	.....	1,638.29	1,638.29
Maintenance materials, Arlington Section	6,232.55	6,232.55	6,232.55	6,232.55	6,232.55	6,232.55	.....	.....	.....	.....	.....
Reconstructing bridge over China Creek	3,533.90	3,533.90	3,533.90	3,533.90	3,533.90	3,533.90	.....	.....	.....	230.75	230.75
GILLIAM AND MORROW COUNTIES											
Maintenance materials, Heppner Junction-Ione	20,471.94	20,471.94	20,471.94	20,471.94	20,471.94	20,471.94	.....	.....	.....	1,233.94	1,233.94
GILLIAM, MORROW AND UMATILLA COUNTIES											
Maintenance materials, Arlington-Pendleton	114,000.00	106,124.85	106,124.85	114,000.00	106,124.85	106,124.85	.....	.....	.....	5,087.46	5,087.46
GILLIAM, SHERMAN AND WASCO COUNTIES											
Maintenance materials, Dillon-Quinton and Biggs-Wasco	20,518.53	20,518.53	20,518.53	20,518.53	20,518.53	20,518.53	.....	.....	.....	1,467.15	1,467.15
GILLIAM AND WHEELER COUNTIES											
Maintenance materials, Olex-Fossil	48,000.00	46,998.23	46,998.23	48,000.00	46,998.23	46,998.23	.....	.....	.....	2,432.75	2,432.75
HOOD RIVER COUNTY											
Maintenance materials, Parkdale Section	30,351.95	30,351.95	30,351.95	30,351.95	30,351.95	30,351.95	.....	.....	.....	885.05	885.05
Maintenance materials, Barlow Pass-North Forest Boundary	23,270.03	23,270.03	23,270.03	23,270.03	23,270.03	23,270.03	.....	.....	.....	1,416.00	1,416.00
JACKSON COUNTY											
Maintenance materials, Siskiyou Summit Quarry	19,344.75	2,760.00	19,344.75	19,344.75	2,760.00	19,344.75	.....	.....	.....	11.77	490.12
Resurfacing and maintenance materials, Pacific Highway-Keene Creek	24,304.96	24,078.66	24,304.96	24,304.96	24,078.66	24,304.96	.....	.....	.....	1,128.64	1,154.94
Maintenance materials, Medford-Prospect	39,609.50	39,609.50	39,609.50	39,609.50	39,609.50	39,609.50	.....	.....	.....	3,766.59	3,766.59
Maintenance materials, Prospect-Park Boundary	23,000.00	11,351.78	11,351.78	23,000.00	11,351.78	11,351.78	.....	.....	.....	1,625.32	1,625.32
Maintenance materials, Gold Hill Section	7,884.47	7,884.47	7,884.47	7,884.47	7,884.47	7,884.47	.....	.....	.....	441.90	441.90
JEFFERSON COUNTY											
Surfacing and maintenance materials, Madras-Opal City	38,392.00	38,392.00	38,392.00	38,392.00	38,392.00	38,392.00	.....	.....	.....	1,378.66	1,378.66
JEFFERSON AND WASCO COUNTIES											
Maintenance materials, Cow Canyon-Madras	24,623.62	24,623.62	24,623.62	24,623.62	24,623.62	24,623.62	.....	.....	.....	903.13	903.13

PROJECT	Estimated Total Cost	During 1857 and 1858
BAKER AND BALDWIN COUNTIES		
Maintenance materials, Baker-Ontario	$ 21,000.00	$
BAKER AND UNION COUNTIES		
Maintenance materials, La Grande-Baker		
BENTON COUNTY		
Resurfacing, Alsea Mountain section		
BENTON AND LINCOLN COUNTIES		
Resurfacing, East Gulf Highway-Blodgett		
Maintenance materials, Missouri Bend section		
CLACKAMAS COUNTY		
Maintenance materials, Multnomah County line-Bennet Creek		
Bennet Creek		
Maintenance materials, Bennet Creek-Abbotsford		
CLATSOP COUNTY		
Maintenance materials, Seaside-Lake Ticket Creek		
Maintenance materials, Jewell junction-Tillamook		
County line		
CLATSOP AND TILLAMOOK COUNTIES		
Maintenance materials, Jack Ticket Creek-Mosier		
COOS COUNTY		
Resurfacing and maintenance materials, Riverton-Coquille		
Coquille-Hollands bridge		
CURRY COUNTY		
Maintenance materials, Euchre Creek-Rogue River		
DESCHUTES COUNTY		
Maintenance materials, Lava Butte-Lavaine		
Maintenance materials, Redmond section		
DOUGLAS COUNTY		
Maintenance materials, Azalea Creek-Winston		
GILLIAM COUNTY		
Resurfacing and maintenance materials, Arlington-Spray Creek		
Maintenance materials, Arlington section		
Reconstruct bridge over China Creek		
GILLIAM AND MORROW COUNTIES		
Maintenance materials, Heppner junction-Lone		
GILLIAM, MORROW AND UMATILLA COUNTIES		
Maintenance materials, Arlington-Irrigon		
GILLIAM, SHERMAN AND WASCO COUNTIES		
Maintenance materials, Dillon Canyon and Biggs-Wasco		
GILLIAM AND WHEELER COUNTIES		
Maintenance materials, Clex-Fossil		
HOOD RIVER COUNTY		
Maintenance materials, Parkdale section		
Maintenance materials, Barlow Pass-North Forest Boundary		
JACKSON COUNTY		
Maintenance materials, Siskiyou Summit County		
Resurfacing and maintenance materials, Ashland Highway-Keene Creek		
Maintenance materials, Medford-Jacksonville		
Maintenance materials, Prospect-Tyler Boundary		
Maintenance materials, Gold Hill section		
JEFFERSON COUNTY		
Surfacing and maintenance materials, Madras-Opal City		
JEFFERSON AND WASCO COUNTIES		
Maintenance materials, Cow Canyon-Biggs		

In this table are listed the expenditures on those projects which have to
sion of the State Highway Commission.

EXPENDITURES FOR FEDERAL AID

l d by nent te	CONSTRUCTION ENGINEERING (Included in Preceding Columns)	
	Cost During 1927 and 1928	Total Cost to Date
.....	$ 628.49	$ 628.49
.....	786.05	786.05
.....	6,557.50	6,557.50
.....	7,115.89	7,115.89
.....	.....	.....
.....	1,305.15	1,305.15
.....	.....	609.90
.....	93.87	689.00
.....	531.20	574.58
.....	101.28	101.28
.....	1,014.98	1,014.98
.....	3.60	3.60
.....	112.92	112.92
.....	525.94	525.94
.....	1,179.43	1,179.43
.....	5.70	5.70
.....	Cr. 76.37	444.02
.....	3,075.23	3,075.23
.....	2,130.26	2,130.26
.....	74.70	426.21
.....	2,868.80	2,868.80
159.35	.....	3,851.09
.....	.....	6,533.92
.....	759.19	759.19
.....	384.70	384.70
.....	697.92	697.92
.....	2,372.29	2,372.29
.....	2,111.49	2,111.49
.....	5,486.40	5,486.40
.....	6,365.59	6,369.59
.....	.....	.....
.....	723.27	723.27
.....	2,067.70	2,067.70
159.35	$ 85,541.54	$ 99,074.09

PROJECT	Estimated Total Cost	Expended Prior to July 1, 1951
BAKER AND MALHEUR COUNTIES		
Maintenance materials, Ironside-Ontario	$ 21,300.00	$ 19,020.17
BAKER AND UNION COUNTIES		
Maintenance materials, La Grande-Baker	22,500.00	22,632.22
BENTON COUNTY		
Resurfacing, Alsea Mountain Section	16,700.00	14,704.22
BENTON AND LINCOLN COUNTIES		
Resurfacing, East Toll, Monmouth-Blodgett	23,000.00	23,171.21
Maintenance materials, Mount Hood Section	5,500.00	5,302.00
CLACKAMAS COUNTY		
Maintenance materials, Multnomah County Line-Bennet Creek	12,250.00	10,239.61
Maintenance materials, Bennet Creek-Hoodsdenton	23,000.00	22,040.12
CLATSOP COUNTY		
Maintenance materials, Sunset Highway-Nehalem Creek	30,000.00	30,131.22
Maintenance materials, Nehalem-Tillamook	18,000.00	17,603.00
Cowlitz Line	1,000.00	1,004.30
CLATSOP AND TILLAMOOK COUNTIES		
Maintenance materials, Jack Horner Creek-Nehalem	15,000.00	15,213.25
COOS COUNTY		
Resurfacing and maintenance materials, Riverton-Coquille-Holland Rocks	11,000.00	11,233.00
CURRY COUNTY		
Maintenance materials, Euchre Creek-Pecwan River	1,000.00	1,003.22
DESCHUTES COUNTY		
Maintenance materials, Lava Butte-Lapine	3,000.00	3,423.22
Maintenance materials, Redmond Section	18,000.00	18,130.22
DOUGLAS COUNTY		
Maintenance materials, Myrtle Creek-Winston	2,000,000.00	2,015,483.62
GILLIAM COUNTY		
Resurfacing and maintenance materials, Arlington-Condon	38,000.00	38,000.00
Maintenance materials, Arlington Section	2,000.00	2,133.22
Reconstruction plugs over China Creek	3,000.00	3,233.00
GILLIAM AND MORROW COUNTIES		
Maintenance materials, Heppner Junction-Lena	50,000.00	50,417.24
GILLIAM, MORROW AND UMATILLA COUNTIES		
Maintenance materials, Arlington-Umatilla	110,000.00	108,181.22
GILLIAM, SHERMAN AND WASCO COUNTIES		
Maintenance materials, Dallas-Condon and Biggs-Wasco	50,000.00	52,218.23
GILLIAM AND WHEELER COUNTIES		
Maintenance materials, Olex-Fossil	48,000.00	48,000.00
HOOD RIVER COUNTY		
Maintenance materials, Fairdale Section	20,000.00	20,321.22
Maintenance materials, Barlow Pass-North Forest Boundary	23,000.00	23,010.00
JACKSON COUNTY		
Maintenance materials, Eighteen Second Corner	18,000.00	18,080.00
Resurfacing and maintenance materials, Jacksonville-Highway-Hanes Creek	24,000.00	24,038.22
Maintenance materials, Medford-Grants Pass	23,000.00	23,000.00
Maintenance materials, Cold Hill Section	14,000.00	14,222.11
JEFFERSON COUNTY		
Surfacing and maintenance materials, Agate-Opal City	38,000.00	38,000.00
JEFFERSON AND WASCO COUNTIES		
Maintenance materials, Cow Canyon-Madras	24,000.00	24,000.00

In this table was listed the expenditures on those projects which have to the date of the State Highway Commission.

EXPENDITURES FOR SPECIAL MA

TABLE XI—Continued

PROJECT	Estimated Total Cost	Expended During 1927 and 1928	Total Expended to Date	STATE FUNDS: State Share of Cost	STATE FUNDS: Expended by State During 1927 and 1928	STATE FUNDS: Total Expended by State to Date	GOVERNMENT FUNDS: Government Share of Cost	GOVERNMENT FUNDS: Expended by Government During 1927 and 1928	GOVERNMENT FUNDS: Total Expended by Government to Date	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Cost During 1927 and 1928	CONSTRUCTION ENGINEERING (Included in Preceding Columns): Total Cost to Date
JOSEPHINE COUNTY											
Maintenance materials, California Line-Deer Creek	$ 11,674.25	$ 11,674.25	$ 11,674.25	$ 11,674.25	$ 11,674.25	$ 11,674.25	$	$	$	$ 628.49	$ 628.49
KLAMATH COUNTY											
Maintenance materials, Sand Creek-Williamson River	21,241.76	21,241.76	21,241.76	21,241.76	21,241.76	21,241.76	.....	.....	.....	786.05	786.05
Resurfacing and maintenance materials, Keno-Klamath Falls	51,000.00	41,182.77	41,182.77	51,000.00	41,182.77	41,182.77	.....	.....	.....	6,557.50	6,557.50
Maintenance materials, Klamath Falls-Merrill-Olene	135,000.00	76,694.03	76,694.03	135,000.00	76,694.03	76,694.03	.....	.....	.....	7,115.89	7,115.89
Resurfacing and maintenance materials, Sand Creek Section	9,000.00	.....	.....	9,000.00	.....	.....	.....	.....	.....	.....	.....
LANE COUNTY											
Maintenance materials, Low Pass Summit-Goldson	31,635.61	31,635.61	31,635.61	31,635.61	31,635.61	31,635.61	.....	.....	.....	1,305.15	1,305.15
LANE AND LINN COUNTIES											
Reconstructing revetment at Harrisburg	36,780.77	5,063.22	36,780.77	36,780.77	5,063.22	36,780.77	.....	.....	.....	.....	609.90
Riprap for revetment at Harrisburg	7,710.64	2,482.31	7,710.64	7,710.64	2,482.31	7,710.64	.....	.....	.....	93.87	689.00
LINCOLN COUNTY											
Resurfacing, West Unit, Eddyville-Blodgett	42,298.94	40,349.67	42,298.94	42,298.94	40,349.67	42,298.94	.....	.....	.....	531.20	574.58
Stripping quarry, Toledo-Eddyville	3,211.34	3,211.34	3,211.34	3,211.34	3,211.34	3,211.34	.....	.....	.....	101.28	101.28
Maintenance materials, Waldport-Hatchery	13,122.51	13,122.51	13,122.51	13,122.51	13,122.51	13,122.51	.....	.....	.....	1,014.98	1,014.98
Maintenance materials, east of Hatchery	3,138.60	3,138.60	3,138.60	3,138.60	3,138.60	3,138.60	.....	.....	.....	3.60	3.60
LINN COUNTY											
Maintenance materials, Sheas Hill-Cascadia	3,489.63	3,489.63	3,489.63	3,489.63	3,489.63	3,489.63	.....	.....	.....	112.92	112.92
MALHEUR COUNTY											
Maintenance materials, Ontario-Nyssa and Cairo-Vale	25,843.18	25,843.18	25,843.18	25,843.18	25,843.18	25,843.18	.....	.....	.....	525.94	525.94
MORROW COUNTY											
Maintenance materials, Ione-Heppner	26,377.27	26,377.27	26,377.27	26,377.27	26,377.27	26,377.27	.....	.....	.....	1,179.43	1,179.43
Resurfacing, Jones Hill Section	1,300.00	1,080.60	1,080.60	1,300.00	1,080.60	1,080.60	.....	.....	.....	5.70	5.70
POLK COUNTY											
Maintenance materials at Wirth Quarry	15,853.37	3,751.96	15,853.37	15,853.37	3,751.96	15,853.37	.....	.....	.....	Cr. 76.37	444.02
POLK AND YAMHILL COUNTIES											
Resurfacing and maintenance materials, Grand Ronde-Sheridan	96,000.00	92,791.70	92,791.70	96,000.00	92,791.70	92,791.70	.....	.....	.....	3,075.23	3,075.23
SHERMAN COUNTY											
Maintenance materials, Moro-Kent	31,000.00	26,369.73	26,369.73	31,000.00	26,369.73	26,369.73	.....	.....	.....	2,130.26	2,130.26
TILLAMOOK COUNTY											
Maintenance materials, Sailing Gravel Pit	19,204.78	14,689.45	19,204.78	19,204.78	14,689.45	19,204.78	.....	.....	.....	74.70	426.21
TILLAMOOK AND YAMHILL COUNTIES											
Maintenance materials, Neskowin-Hebo-Grande Ronde	59,000.00	49,719.70	49,719.70	59,000.00	49,719.70	49,719.70	.....	.....	.....	2,868.80	2,868.80
UMATILLA COUNTY											
Resurfacing, Emigrant Hill Section	68,977.63	.....	68,977.63	28,818.28	Cr40,159.35	28,818.28	40,159.35	40,159.35	40,159.35	.....	3,851.09
Resurfacing, Umatilla-Nolin	119,047.93	243.80	119,047.93	119,047.93	243.80	119,047.93	.....	.....	.....	.....	6,533.92
Maintenance materials, Pilot Rock-Freewater (A)	17,000.00	14,360.38	14,360.38	17,000.00	14,360.38	14,360.38	.....	.....	.....	759.19	759.19
Maintenance materials near Pilot Rock	8,861.91	8,861.91	8,861.91	8,861.91	8,861.91	8,861.91	.....	.....	.....	384.70	384.70
Maintenance materials, Pilot Rock-Freewater (B)	22,000.00	13,014.75	13,014.75	22,000.00	13,014.75	13,014.75	.....	.....	.....	697.92	697.92
Resurfacing and maintenance materials. West Unit, Pendleton-Kamela	47,311.34	47,311.34	47,311.34	47,311.34	47,311.34	47,311.34	.....	.....	.....	2,372.29	2,372.29
Resurfacing and maintenance materials. East Unit, Pendleton-Kamela	105,000.00	79,162.11	79,162.11	105,000.00	79,162.11	79,162.11	.....	.....	.....	2,111.49	2,111.49
UNION COUNTY											
Resurfacing and maintenance materials. LaGrande-Minam	72,903.77	72,903.77	72,903.77	72,903.77	72,903.77	72,903.77	.....	.....	.....	5,486.40	5,486.40
WALLOWA COUNTY											
Resurfacing, Rock Creek-Lostine	87,450.56	87,446.56	87,450.56	87,450.56	87,446.56	87,450.56	.....	.....	.....	6,365.59	6,369.59
Maintenance materials, Flora-Enterprise	1,196.36	1,196.36	1,196.36	1,196.36	1,196.36	1,196.36	.....	.....	.....	.....	.....
WASCO COUNTY											
Maintenance materials, The Dalles-Dillon-Dufur	12,752.41	12,752.41	12,752.41	12,752.41	12,752.41	12,752.41	.....	.....	.....	723.27	723.27
Maintenance materials, Dufur-Cow Canyon	40,000.00	18,316.59	18,316.59	40,000,00	18,316.59	18,316.59	.....	.....	.....	2,067.70	2,067.70
	$2,159,092.30	$1,628,708.67	$1,907,181.31	$2,118,932.95	$1,588,549.32	$1,867,021.96	$ 40,159.35	$ 40,159.35	$ 40,159.35	$ 85,541.54	$ 99,074.09

SUMMARY

Cooperating Parties	Estimated Cooperative Shares	Expended Prior to Dec. 1, 1926	Expended Dec. 1, 1926, to Nov. 30, 1928	Total Expended to Date	Cost to Complete
State	$2,118,932.95	$ 278,472.64	$1,588,549.32	$1,867,021.96	$ 251,910.99
Federal government	40,159.35	.....	40,159.35	40,159.35	.....
Totals	$2,159,092.30	$ 278,472.64	$1,628,708.67	$1,907,181.31	$ 251,910.99

PROJECT					

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all forest road work. It
es upon forest road work

included in this table.

FEDERAL FUNDS	
Government Share of Cost	Expended from Government Funds to Date
$ 2,500.00	$ 2,500.00
307,096.10	307,096.10
499,017.65	499,017.65
115,620.41	115,620.41
70,500.00	70,500.00
563.05	563.05
9,974.55	9,974.55
1,846.14	1,846.14
80,116.55	80,116.55
68,674.06	68,674.06
44,634.17	44,634.17
75,492.95	75,492.95
58,000.00	58,000.00
8,772.36	8,772.36
67,937.33	67,937.33
41,606.54	41,606.54
6,373.21	6,373.21
322,460.36	322,460.36
33,333.34	33,333.34
94,000.00	94,000.00
10,000.00	10,000.00
2,500.00	2,500.00
54,000.00	42,873.26
22,000.00	20,541.19
3,270.76	1,881.40
121,095.20	121,095.20
150,210.38	150,210.38
53,439.30	53,439.30
28,516.32	28,516.32
102,312.28	102,312.28
10,000.00	10,000.00
16,000.00	16,000.00
23,500.00	22,969.75
2,500.00	2,100.18

PROJECT	Estimated Total Cost	Expended Prior to 1935 and 1936
JOSEPHINE COUNTY		
Maintenance materials, California Line-Deer Creek	$ 11,674.73	$ 11,674.23
KLAMATH COUNTY		
Maintenance materials, Sand Creek-Williamson River	21,241.76	21,241.76
Resurfacing and maintenance materials, Keno-Klamath Falls	51,000.00	41,122.37
Maintenance materials, Klamath Falls-Merrill-Olene	136,000.00	76,234.03
Resurfacing and maintenance materials, Sand Creek Section	9,000.00	....
LANE COUNTY		
Maintenance materials, Low Pass Summit-Goldson	31,635.61	31,635.61
LANE AND LINN COUNTIES		
Reconstructing revetment at Harrisburg	36,740.77	75,062.22
Riprap for revetment at Harrisburg	7,720.64	2,483.81
LINCOLN COUNTY		
Resurfacing, West Unit, Eddyville-Blodgett	42,298.34	40,342.87
Stripping quarry, Toledo-Eddyville	2,211.34	3,211.34
Maintenance materials, Waldport-Hatchery	13,122.51	13,122.51
Maintenance materials, east of Hatchery	3,138.60	3,138.60
LINN COUNTY		
Maintenance materials, Sheas Hill-Cascadia	3,486.63	3,459.63
MALHEUR COUNTY		
Maintenance materials, Ontario-Nyssa and Cairo-Vale	25,843.18	25,843.15
MORROW COUNTY		
Maintenance materials, Ione-Heppner	26,377.27	26,377.27
Resurfacing, Jones Hill Section	1,200.00	1,080.69
POLK COUNTY		
Maintenance materials at Wirth Quarry	15,355.37	3,751.96
POLK AND YAMHILL COUNTIES		
Resurfacing and maintenance materials, Grand Ronde-Sheridan	95,000.00	92,731.70
SHERMAN COUNTY		
Maintenance materials, Moro-Kent	21,000.00	26,369.72
TILLAMOOK COUNTY		
Maintenance materials, Sailing Gravel Pit	13,204.78	14,683.45
TILLAMOOK AND YAMHILL COUNTIES		
Maintenance materials, Neskowin-Hebo-Grande Ronde	53,000.00	43,713.79
UMATILLA COUNTY		
Resurfacing, Emigrant Hill Section	63,377.63	....
Resurfacing, Umatilla-Nolin	115,047.93	243.30
Maintenance materials, Pilot Rock-Freewater (A)	17,000.00	14,360.33
Maintenance materials near Pilot Rock	8,861.91	8,861.91
Maintenance materials, Pilot Rock-Freewater (B)	25,000.00	13,014.75
Resurfacing and maintenance materials, West Unit, Pendleton-Kamela	47,211.34	47,211.24
Resurfacing and maintenance materials, East Unit, Pendleton-Kamela	105,000.00	79,163.11
UNION COUNTY		
Resurfacing and maintenance materials, LaGrande-Minam	72,903.77	72,903.77
WALLOWA COUNTY		
Resurfacing, Rock Creek-Lostine	87,450.66	87,116.56
Maintenance materials, Flora-Enterprise	21,196.36	21,196.36
WASCO COUNTY		
Maintenance materials, The Dalles-Dillon-Dufur	112,752.41	112,752.41
Maintenance materials, Dufur-Cow Canyon	40,000.00	18,316.59
	$2,180,392.20	$1,628,705.67

SUMMARY

Cooperating Parties	Expended Dec. 1, 1936, to Nov. 30, 1938	Total Expended to Date
State	[illegible]	[illegible]
Federal government	[illegible]	[illegible]
Totals	$1,628,705.67	[illegible]

TABLE XII

EXPENDITURES ON FOREST ROAD PROJECTS—TO NOVEMBER 30, 1928

The expenditures of state funds as shown in the following table are the actual disbursements as shown by the books of the Highway Department. The expenditures of county funds and of federal government funds are as reported to the Highway Department by the United States Bureau of Public Roads, which bureau supervises all forest road work. It is to be noted that in those tables given in other parts of this report, which set out the total expenditures of the State Highway Department, only those expenditures upon forest road work which are made by the State are included.

All forest road projects upon the state highway system that have been undertaken since the beginning of cooperative forest road construction in 1917 are included in this table.

Projects	Length in Miles	Estimated Total Cost	Total Expended to Date	STATE FUNDS				COUNTY FUNDS		FEDERAL FUNDS	
				State Share of Cost	Expended State Funds Prior to 1927	Expended State Funds During 1927-1928	Expended from State Funds to Date	County Share of Cost	Expended from County Funds to Date	Government Share of Cost	Expended from Government Funds to Date
BAKER AND GRANT COUNTIES											
Prairie City-Unity, survey	41.90	$ 7,000.00	$ 7,000.00	$ 2,500.00	$ 2,500.00	$	$ 2,500.00	$ 2,000.00	$ 2,000.00	$ 2,500.00	$ 2,500.00
Prairie City-Unity, grading and surfacing	42.52	614,192.20	614,192.20	146,985.34	163,750.00	Cr 16,764.66	146,985.34	160,110.76	160,110.76	307,096.10	307,096.10
CLACKAMAS AND HOOD RIVER COUNTIES											
Mt. Hood Loop, grading and surfacing	37.48	998,706.03	998,706.03	499,688.38	499,688.38	.....	499,688.38	.....	.....	499,017.65	499,017.65
Mt. Hood Loop, roadbed widening	10.00	115,620.41	115,620.41	.....	.....	.....	.....	.....	.....	115,620.41	115,620.41
CLACKAMAS AND WASCO COUNTIES											
Mt. Hood-Clear Lake, grading	7.46	141,000.00	141,000.00	70,500.00	70,500.00	.....	70,500.00	.....	.....	70,500.00	70,500.00
Mt. Hood-Clear Lake, Barlow Road	.....	1,063.05	1,063.05	500.00	500.00	.....	500.00	.....	.....	563.05	563.05
Mt. Hood-Wapinitia, survey	32.84	14,974.55	14,974.55	5,000.00	5,000.00	.....	5,000.00	.....	.....	9,974.55	9,974.55
Mt. Hood-Clear Lake, maintenance	.....	3,692.28	3,692.28	1,846.14	1,070.01	776.13	1,846.14	.....	.....	1,846.14	1,846.14
COOS COUNTY											
Hauser-Douglas County Line, grading and surfacing	8.33	163,116.55	163,116.55	.....	1,713.61	Cr 1,713.61	.....	83,000.00	83,000.00	80,116.55	80,116.55
Lakeside-Lake Saunders, grading	3.30	68,674.06	68,674.06	.....	.....	.....	.....	.....	.....	68,674.06	68,674.06
CROOK COUNTY											
Ochoco Canyon Section, grading and surfacing	9.70	111,143.34	111,143.34	39,634.17	39,634.17	.....	39,634.17	26,875.00	26,875.00	44,634.17	44,634.17
CURRY COUNTY											
Brush Creek-Mussel Creek, grading and surfacing	6.10	150,492.95	150,492.95	45,000.00	45,000.00	.....	45,000.00	30,000.00	30,000.00	75,492.95	75,492.95
Mussel Creek-Euchre Creek, grading	4.90	129,289.11	129,289.11	71,289.11	71,289.11	.....	71,289.11	.....	.....	58,000.00	58,000.00
Mussel Creek-Gold Beach, survey	.....	8,772.36	8,772.36	.....	.....	.....	.....	.....	.....	8,772.36	8,772.36
Euchre Creek-Rogue River, surfacing	11.00	67,937.33	67,937.33	.....	.....	.....	.....	.....	.....	67,937.33	67,937.33
DESCHUTES COUNTY											
Sisters Section, surfacing	14.30	83,213.09	83,213.09	41,606.55	41,606.55	.....	41,606.55	.....	.....	41,606.54	41,606.54
Sisters Section, maintenance	.....	12,746.42	12,746.42	6,373.21	6,062.61	310.60	6,373.21	.....	.....	6,373.21	6,373.21
DESCHUTES AND LANE COUNTIES											
Sisters-Blue River, grading and surfacing	50.10	644,870.72	644,870.72	302,410.36	302,410.36	.....	302,410.36	20,000.00	20,000.00	322,460.36	322,460.36
DOUGLAS COUNTY											
Tiller-Trail, grading	3.94	100,000.00	100,000.00	33,333.33	33,333.33	.....	33,333.33	33,333.33	33,333.33	33,333.34	33,333.34
Unit 1, Canyonville-Galesville, grading	9.90	211,000.00	211,000.00	94,000.00	94,000.00	.....	94,000.00	23,000.00	23,000.00	94,000.00	94,000.00
Unit 2, Canyonville-Galesville, grading	1.10	98,776.86	98,776.86	88,776.86	88,776.86	.....	88,776.86	.....	.....	10,000.00	10,000.00
GRANT COUNTY											
Beech Creek-Long Creek, survey	14.20	5,000.00	5,000.00	.....	.....	.....	.....	2,500.00	2,500.00	2,500.00	2,500.00
Fox Section, grading and surfacing	13.97	108,000.00	96,873.26	.....	.....	.....	.....	54,000.00	54,000.00	54,000.00	42,873.26
Beech Creek Section, grading and surfacing	4.10	42,000.00	40,541.19	20,000.00	.....	20,000.00	20,000.00	.....	.....	22,000.00	20,541.19
Beech Creek Section, survey	6.53	3,270.76	1,881.40	.....	.....	.....	.....	.....	.....	3,270.76	1,881.40
JACKSON COUNTY											
Crater Lake-Prospect, grading	21.71	245,629.21	245,629.21	121,095.20	121,095.20	.....	121,095.20	3,438.81	3,438.81	121,095.20	121,095.20
Trail-Prospect, grading and surfacing	13.60	300,210.38	300,210.38	150,000.00	150,000.00	.....	150,000.00	.....	.....	150,210.38	150,210.38
Silver Creek-Park Boundary, surfacing	6.50	53,439.30	53,439.30	.....	.....	.....	.....	.....	.....	53,439.30	53,439.30
JOSEPHINE COUNTY											
Hayes Hill, grading and surfacing	2.39	76,272.70	76,272.70	38,233.39	38,233.39	.....	38,233.39	9,522.99	9,522.99	28,516.32	28,516.32
Oregon Caves, grading	11.68	204,624.55	204,624.55	102,312.27	102,312.27	.....	102,312.27	.....	.....	102,312.28	102,312.28
O'Brien School-California Line, grading	5.39	85,887.93	85,887.93	75,887.93	80,000.00	Cr 4,112.07	75,887.93	.....	.....	10,000.00	10,000.00
O'Brien School-California Line, surfacing	5.39	32,000.00	32,000.00	16,000.00	16,000.00	.....	16,000.00	.....	.....	16,000.00	16,000.00
Oregon Caves Section, widening	11.68	53,500.00	52,969.75	25,000.00	.....	25,000.00	25,000.00	5,000.00	5,000.00	23,500.00	22,969.75
Oregon Caves Section, survey	8.00	2,500.00	2,100.18	.....	.....	.....	.....	.....	.....	2,500.00	2,100.18

Oregon Caves Section, surveys	3.00	3,200.00			
Oregon Caves Section, alignment	11.83	23,100.00			
O.Brien School-California Line, surfacing	2.25	33,000.00			
O.Brien School-California Line, grading	2.25	22,725.00			
Oregon Caves, grading	11.82	301,854.00			
Hayes Hill, grading and surfacing	2.36	17,315.10			
JOSEPHINE COUNTY					
Grave Creek-Tark Boundary, surfacing	8.20	23,432.20			
Tiger-Prospect, grading and surfacing	12.00	230,010.38			
Crater Lake-Prospect, grading	21.17	542,258.57			
JACKSON COUNTY					
Beagle Creek Section, surveys	6.23	3,210.10			
Beagle Creek Section, grading and surfacing	4.10	42,000.00			
Fox Section, grading and surfacing	12.31	103,000.00			
Beagle Creek-Lone Creek, survey	14.50	2,000.00			
GRANT COUNTY					
Unit 3, Canyonville-Glendale, grading	1.10	32,170.32			
Unit 1, Canyonville-Glendale, grading	9.50	311,000.00			
Tiger-Tiger, grading	3.04	100,000.00			
DOUGLAS COUNTY					
Siskiyou-Bone Kiver, grading and surfacing	20.10	614,270.13			
DESCHUTES AND LANE COUNTIES					
Sisters Section, maintenance		12,748.43			
Sisters Section, surfacing	14.30	88,313.08			
DESCHUTES COUNTY					
Shevlin Creek-Horse Kiver, surfacing	11.00	67,931.32			
Alfalfa Creek-Gold Beach, survey		3,115.30			
Alsea Creek-Eagle Creek, grading	4.30	158,358.11			
Bear Creek-Alsea Creek, grading and surfacing	6.10	120,493.32			
CURRY COUNTY					
Ochoco Canyon Section, grading and surfacing	6.10	111,142.34			
CROOK COUNTY					
Idaho-Idaho Boundary, grading	3.30	38,814.80			
Hauser-Douglas County Line, grading and surfacing	3.33	103,110.30			
COOS COUNTY					
Mt. Hood-Crest Idaho, maintenance		3,285.35			
Mt. Hood-Wapinitia, survey	48.35	14,170.42			
Mt. Hood-Crest Idaho, Bottom Road		1,365.00			
Mt. Hood-Crest Idaho, grading	7.40	101,000.00			
CLACKAMAS AND WASCO COUNTIES					
Mt. Hood Loop, temporary widening	10.00	11,630.11			
Mt. Hood Loop, grading and surfacing	38.48	399,107.03			
CLACKAMAS AND HOOD RIVER COUNTIES					
Prairie City-John Day, grading and surfacing	43.85	614,281.30			
Prairie City-John Day, survey	11.80	1,200.00			
BAKER AND GRANT COUNTIES					

Miles of Roadway	Estimated Total Cost	Protected

All forest road projects upon the state highway system that have been in which are made by the State are included.

is to be noted that in those tables given in other parts of this report, which are finds and of federal government funds are as reported to the Highway Dep-

The expenditures of state funds as shown in the following table are p

EXPENDITURES ON

FEDERAL FUNDS	
Government Share of Cost	Expended from Government Funds to Date
$ 7,103.57	$ 7,103.57
22,862.16	22,862.16
134,585.36	134,585.36
113,762.53	113,762.53
59,739.71	59,739.71
879.37	879.37
46,000.00	28,604.05
20,367.38	13,946.66
123,019.51	122,589.46
3,866.41	3,866.41
246,735.42	246,735.42
1,675.58	1,675.58
30,076.69	30,076.69
4,883.36	4,883.36
22,500.00	22,500.00
25,000.00	25,000.00
31,387.95	31,387.95
12,594.54	10,405.79
75,000.00	19,254.87
137,000.00	137,000.00
81,000.00	81,000.00
163,000.00	30,131.19
299,500.00	299,500.00
20,073.90	18,715.20
42,266.78	42,266.78
65,000.00	62,294.84
15,000.00	11,201.11
41,747.17	41,747.17
73,336.20	73,336.20
3,132.76	3,132.76
53,458.63	53,458.63
76,451.27	76,451.27
41,000.00	36,091.70
50,000.00	30,618.13
53,000.00	32,853.52
109,050.00	109,050.00
$4,813,919.26	$4,531,665.47

TABLE XII—Continued

Projects	Length in Miles	Estimated Total Cost	Total Expended to Date	STATE FUNDS				COUNTY FUNDS		FEDERAL FUNDS	
				State Share of Cost	Expended State Funds Prior to 1927	Expended State Funds During 1927-1928	Expended from State Funds to Date	County Share of Cost	Expended from County Funds to Date	Government Share of Cost	Expended from Government Funds to Date
KLAMATH COUNTY											
Unit 1, Anna Creek Section, grading and surfacing	3.50	$ 14,207.13	$ 14,207.13	$ 7,103.56	$ 7,103.56	$	$ 7,103.56	$	$	$ 7,103.57	$ 7,103.57
Unit 2, Anna Creek Section, grading and surfacing	6.70	68,586.48	68,586.48	22,862.16	22,862.16	.....	22,862.16	22,862.16	22,862.16	22,862.16	22,862.16
Ft. Klamath-Sand Creek, grading and surfacing	20.20	269,170.71	269,170.71	.....	.....	.....	.....	134,585.35	134,585.35	134,585.36	134,585.36
Beaver Marsh Section, grading and surfacing	17.00	227,525.06	227,525.06	113,762.53	113,400.00	362.53	113,762.53	.....	.....	113,762.53	113,762.53
Corral Springs Section, grading and surfacing	20.50	139,790.92	139,790.92	65,043.75	67,536.33	Cr 2,492.58	65,043.75	15,007.46	15,007.46	59,739.71	59,739.71
KLAMATH AND LAKE COUNTIES											
Lakeview-Lapine survey	18.20	1,758.74	1,758.74	879.37	879.37	.....	879.37	.....	.....	879.37	879.37
Klamath Section, grading	3.30	46,000.00	28,604.05	.....	.....	.....	.....	.....	.....	46,000.00	28,604.05
KLAMATH AND LANE COUNTIES											
Lowell-Crescent, survey	39.70	33,867.38	27,446.66	13,500.00	13,500.00	.....	13,500.00	.....	.....	20,367.38	13,946.66
LAKE COUNTY											
West Forest Bdry-Drews Valley, grading and sufacing	11.70	249,939.01	249,508.96	126,919.50	50,000.00	76,919.50	126,919.50	.....	.....	123,019.51	122,589.46
LANE COUNTY											
Eugene-Florence, survey	24.00	7,732.82	7,732.82	3,866.41	3,866.41	.....	3,866.41	.....	.....	3,866.41	3,866.41
Blachly-Rainrock, grading and surfacing	23.50	529,235.42	529,235.42	132,500.00	132,500.00	.....	132,500.00	150,000.00	150,000.00	246,735.42	246,735.42
Portage Section, survey	3.60	1,675.58	1,675.58	.....	.....	.....	.....	.....	.....	1,675.58	1,675.58
Portage Section, grading and surfacing	2.16	40,076.69	40,076.69	.....	.....	.....	.....	10,000.00	10,000.00	30,076.69	30,076.69
Lost Saddle Section, survey	5.95	4,883.36	4,883.36	.....	.....	.....	.....	.....	.....	4,883.36	4,883.36
Belknap Springs-East, surfacing	7.90	45,000.00	45,000.00	22,500.00	22,500.00	.....	22,500.00	.....	.....	22,500.00	22,500.00
Dead Horse Grade, grading and surfacing	3.50	50,000.00	50,000.00	25,000.00	25,000.00	.....	25,000.00	.....	.....	25,000.00	25,000.00
Summit Section, surfacing	10.50	62,775.89	62,775.89	31,387.94	31,387.94	.....	31,387.94	.....	.....	31,387.95	31,387.95
Florence-Rainrock, survey	19.60	15,594.54	13,405.79	3,000.00	.....	3,000.00	3,000.00	.....	.....	12,594.54	10,405.79
Goodman Creek Section, grading	5.54	112,500.00	29,254.87	.....	.....	.....	.....	37,500.00	10,000.00	75,000.00	19,254.87
LINCOLN COUNTY											
Unit 1, Alsea River, grading and surfacing	28.70	367,000.00	367,000.00	137,000.00	137,000.00	.....	137,000.00	93,000.00	93,000.00	137,000.00	137,000.00
Unit 2, Alsea River, grading and sufacing	16.15	307,262.78	307,262.78	154,262.78	124,000.00	30,262.78	154,262.78	72,000.00	72,000.00	81,000.00	81,000.00
South Beach-Beaver Creek, grading	8.10	163,000.00	30,131.19	.....	.....	.....	.....	.....	.....	163,000.00	30,131.19
LINCOLN AND TILLAMOOK COUNTIES											
Neskowin-Siletz, grading and surfacing	23.02	755,000.00	755,000.00	335,500.00	335,500.00	.....	335,500.00	120,000.00	120,000.00	299,500.00	299,500.00
LINN COUNTY											
Santiam Highway, survey	48.00	20,073.90	18,715.20	.....	.....	.....	.....	.....	.....	20,073.90	18,715.20
Unit 1, Cascadia-Sheas Hill, grading and surfacing	3.80	80,266.78	80,266.78	.....	.....	.....	.....	38,000.00	38,000.00	42,266.78	42,266.78
Unit 2, Cascadia-Sheas Hill, grading and surfacing	6.60	128,500.00	125,794.84	.....	.....	.....	.....	63,500.00	63,500.00	65,000.00	62,294.84
Cascadia-East, grading	2.80	30,000.00	26,201.11	.....	.....	.....	.....	15,000.00	15,000.00	15,000.00	11,201.11
TILLAMOOK COUNTY											
Three Rivers Section, grading and surfacing	8.70	209,900.37	209,900.37	149,528.51	149,528.51	.....	149,528.51	18,624.69	18,624.69	41,747.17	41,747.17
UMATILLA COUNTY											
Ukiah-Albee, grading and surfacing	7.16	76,336.20	76,336.20	.....	.....	.....	.....	3,000.00	3,000.00	73,336.20	73,336.20
WALLOWA COUNTY											
Flora-Enterprise, survey	9.00	3,132.76	3,132.76	.....	.....	.....	.....	.....	.....	3,132.76	3,132.76
Flora-Enterprise, grading and surfacing	12.90	136,620.63	136,620.63	55,951.65	55,951.65	.....	55,951.65	27,210.35	27,210.35	53,458.63	53,458.63
Flora Section, grading and surfacing	9.70	100,451.27	100,451.27	12,000.00	.....	12,000.00	12,000.00	12,000.00	12,000.00	76,451.27	76,451.27
WASCO COUNTY											
Wapinitia Section, clearing 29.5 miles, grading	11.76	82,998.33	78,090.03	16,998.33	14,603.10	2,395.23	16,998.33	25,000.00	25,000.00	41,000.00	36,091.70
Elk Creek, grading 11.1 miles Wapinitia, surfacing	11.76	155,000.00	135,618.13	105,000.00	.....	105,000.00	105,000.00	.....	.....	50,000.00	30,618.13
Elk Creek, grading (1929 project)	2.30	53,000.00	32,853.52	.....	.....	.....	.....	.....	.....	53,000.00	32,853.52
WHEELER COUNTY											
Ochoco Canyon Section, grading and surfacing	9.73	219,010.12	219,010.12	105,060.12	105,060.12	.....	105,060.12	4,900.00	4,900.00	109,050.00	109,050.00
Totals		$9,766,489.01	$9,456,735.22	$3,637,598.85	$3,386,655.00	$ 250,943.85	$3,637,598.85	$1,314,970.90	$1,287,470.90	$4,813,919.26	$4,531,665.47

SUMMARY

Cooperating Parties	Estimated Cooperative Shares	Expended Prior to Dec. 1, 1926	Expended Dec. 1, 1926, to Nov. 30, 1928	Total Expended to Date	Estimated Cost to Complete
State	$3,637,598.85	$3,386,655.00	$250,943.85	$3,637,598.85	$ .....
Counties	1,314,970.90	1,127,315.75	160,155.15	1,287,470.90	27,500.00
Federal Government	4,813,919.26	3,948,876.35	582,789.12	4,531,665.47	282,253.79
Totals	$9,766,489.01	$8,462,847.10	$993,888.12	$9,456,735.22	$309,753.79

MARION COUNTY			
Quartz Creek section, Middle Fork and tributaries	22.8	512,610.00	512
MARION COUNTY			
Elk Creek, Middle (Jack Young)	3.30	33,000.00	33
Elk Creek, Middle, LLL mines, Marbrittan and tributaries	11.10	111,000.00	111
Marbrittle section, Cleveland Mill mines, Middle	11.70	58,500.00	59
MATTOLE COUNTY			
Mora section, Middle and tributaries	9.10	191,100.00	191
Mora-Enterprise, Middle and tributaries	15.30	153,000.00	153
Mora-Enterprise survey	3.00	3,000.00	3
MATTOLE COUNTY			
Upper Alder, Middle and tributaries	4.10	41,000.00	41
TRINITY COUNTY			
Three Rivers section, Middle and tributaries	8.50	255,000.00	255
LILLAHOOK COUNTY			
Cascade-East, Middle	3.30	33,000.00	33
Left L. Cascade-Spruce Hill, Middle and tributaries	3.30	198,000.00	198
Left L. Cascade-Spruce Hill, Middle and tributaries	3.30	27,500.00	28
Mt. Baldwin Highway, survey	42.00	30,870.00	31
LINN COUNTY			
Anderson-Salmon, Middle and tributaries	23.05	460,000.00	460
LINCOLN AND LILLAHOOK COUNTIES			
South Beach-Bernard Creek, Middle	8.10	162,000.00	162
Left L. Alder Inlet, Middle and tributaries	15.12	302,400.00	302
Left L. Alder Inlet, Middle and tributaries	33.10	662,000.00	662
LINCOLN COUNTY			
Goodman Creek section, Middle	2.24	112,000.00	112
Florence-Eastlock, survey	15.30	12,000.00	12
Summit section, Middle	15.10	23,100.00	23
Deep Horse Grade, Middle and tributaries	3.10	120,000.00	120
Ralph Shanks-Bear, Middle	1.90	38,000.00	38
Lost Middle section, survey	2.32	4,000.00	4
Fortune section, Middle and tributaries	5.10	40,000.00	40
Fortune section, survey	3.00	1,000.00	1
Hancock-Hemlock, Middle and tributaries	27.20	256,000.00	256
Larsen-Florence, survey	30.00	1,000.00	1
LANE COUNTY			
West Forest Hall-Camp Valley, Middle and tributaries	11.10	518,000.00	518
LANE COUNTY			
Lowell-Crescent, survey	28.10	28,000.00	28
KLAMATH AND LANE COUNTIES			
Klamath section, Middle	8.30	48,000.00	48
Lakeview-Alpine survey	12.50	1,250.00	1
KLAMATH AND LAKE COUNTIES			
Coast Springs section, Middle and tributaries	30.60	153,000.00	153
Bryant Ranch section, Middle and tributaries	11.00	231,000.00	231
Mt. Klamath-Sand Creek, Middle and tributaries	17.10	171,000.00	171
Unit L, Alder Creek section, Middle and tributaries	6.10	24,000.00	24
Unit L, Alder Creek section, Middle and tributaries	5.20	14,300.00	14
KLAMATH COUNTY			

TABLE XIII

EXPENDITURES FOR MINOR ADDITIONS AND BETTERMENTS

December 1, 1926, to November 30, 1928

County	Expended Dec. 1, 1926 to Nov. 30, 1927	Expended Dec. 1, 1927, to Nov. 30, 1928	Total Expenditures 1927-1928 Biennium
Baker	$ 8,333.33	$ 1,771.07	$ 10,104.40
Benton	4,593.76	1,819.63	6,413.39
Clackamas	8,350.67	72,348.34	80,699.01
Clatsop	125.52	20,209.41	20,334.93
Columbia	.....	14,939.03	14,939.03
Coos	10,063.28	66,567.74	76,631.02
Crook	695.61	1,361.69	2,057.30
Curry	7,467.59	12,160.05	19,627.64
Deschutes	1,731.73	2,953.01	4,684.74
Douglas	20,818.91	10,312.44	31,131.35
Gilliam	552.85	1,814.74	2,367.59
Grant	4,013.79	929.15	4,942.94
Harney	988.89	.....	988.89
Hood River	6,442.01	34,033.54	40,475.55
Jackson	13,856.51	167,133.31	180,989.82
Jefferson	2,578.93	224.19	2,803.12
Josephine	1,067.21	12,494.20	13,561.41
Klamath	2,371.31	2,267.40	4,638.71
Lake	9,617.26	2,682.01	12,299.27
Lane	2,009.78	5,232.25	7,242.03
Lincoln	958.38	7,402.41	8,360.79
Linn	934.38	3,749.48	4,683.86
Malheur	12,687.13	1,412.01	14,099.14
Marion	7,394.15	97.34	7,491.49
Morrow	1,292.84	7,233.17	8,526.01
Polk	7,785.79	40,431.81	48,217.60
Sherman	943.23	4,235.52	5,178.75
Tillamook	626.51	38,381.30	39,007.81
Umatilla	30,804.99	84,475.62	115,280.61
Union	17,080.24	48,894.19	65,974.43
Wallowa	3,412.62	3,338.49	6,751.11
Wasco	3,433.07	5,656.11	9,089.18
Washington	1,778.44	3.60	1,782.04
Wheeler	2,828.53	5,290.76	8,119.29
Yamhill	23,624.52	39,784.61	63,409.13
Totals	$221,263.76	$721,639.62	$942,903.38

TABLE XIV

EXPENDITURES FOR GENERAL MAINTENANCE WORK

December 1, 1926, to November 30, 1928

County	Expended Dec. 1, 1926, to Nov. 30, 1927	Expended Dec. 1, 1927, to Nov. 30, 1928	Total Expenditures 1927-1928 Biennium
Baker	$ 94,730.59	$102,603.52	$197,334.11
Benton	64,904.00	74,203.82	139,107.82
Clackamas	67,595.48	53,465.68	121,061.16
Clatsop	44,775.32	39,083.32	83,858.64
Columbia	18,493.52	23,161.19	41,654.71
Coos	101,581.24	79,890.97	181,472.21
Crook	24,104.65	20,355.17	44,459.82
Curry	38,228.18	79,491.82	117,720.00
Deschutes	70,259.89	86,143.99	156,403.88
Douglas	108,700.28	114,965.30	223,665.58
Gilliam	62,316.08	80,239.38	142,555.46
Grant	40,829.42	37,252.13	78,081.55
Harney	7,091.21	8,228.00	15,319.21
Hood River	102,231.16	63,999.91	166,231.07
Jackson	95,636.45	106,561.97	202,198.42
Jefferson	39,296.44	33,378.26	72,674.70
Josephine	74,090.90	49,678.02	123,768.92
Klamath	219,383.09	170,658.71	390,041.80
Lake	24,732.43	29,333.25	54,065.68
Lane	99,988.05	101,249.60	201,237.65
Lincoln	28,969.76	90,599.95	119,569.71
Linn	28,118.80	37,416.46	65,535.26
Malheur	76,378.66	46,436.82	122,815.48
Marion	32,400.38	36,881.79	69,282.17
Morrow	51,343.75	81,373.28	132,717.03
Multnomah	304.36	8,363.68	8,668.04
Polk	22,556.16	22,782.46	45,338.62
Sherman	59,432.60	56,064.57	115,497.17
Tillamook	81,660.82	83,177.56	164,838.38
Umatilla	134,102.32	119,767.31	253,869.63
Union	102,320.72	116,945.24	219,265.96
Wallowa	35,201.94	36,017.91	71,219.85
Wasco	82,266.24	136,725.49	218,991.73
Washington	14,812.92	12,477.57	27,290.49
Wheeler	23,831.87	25,085.38	48,917.25
Yamhill	40,473.82	51,263.33	91,737.15
Undistributed expense	3,966.60	Cr. 6,477.14	Cr. 2,510.54
General Supervision	97,380.77	115,426.41	212,807.18
Totals	$2,314,490.87	$2,424,272.08	$4,738,762.95

All of the above expenditures were made from state funds.

TABLE XV

EXPENDITURES FOR ADDITIONS AND BETTERMENTS CLASSIFIED AS TO KINDS OF WORK

December 1, 1926, to November 30, 1928.

The expenditures listed in this table are a repetition of the expenditures listed in Table X, where major additions and betterments are classified by projects, and of the expenditures listed in Table XIII, where minor additions and betterments are classified by counties.

Classification	Expended Dec. 1, 1926 to Nov. 30, 1927	Expended Dec. 1, 1927 to Nov. 30, 1928	Total Expenditures 1927-1928 Biennium
MINOR BETTERMENT			
Concrete Pavement	$ 134.37	$ 1,285.54	$ 1,419.91
Bituminous Pavement	22,109.69	10,322.86	32,432.55
Rock Shoulders to Pavement	2,451.98	51,423.13	53,875.11
Bituminous Macadam	25,344.13	432,755.92	458,100.05
Rock or Gravel Surfacing	10,691.12	11,733.15	22,424.27
Grading and Roadbed Widening	42,720.70	71,122.54	113,843.24
Culverts and Drains	68,808.97	73,884.35	142,693.32
Miscellaneous Structures	2,032.37	6,064.30	8,096.67
Guard Fence	6,361.51	9,220.35	15,581.86
Bridges	36,234.70	47,806.73	84,041.43
Snow Fence	1,882.62	2,343.68	4,226.30
Miscellaneous	2,491.60	3,677.07	6,168.67
Total for Minor Betterment	$ 221,263.76	$ 721,639.62	$ 942,903.38
MAJOR BETTERMENT			
Concrete Pavement	$ 106,443.80	$ 7,250.47	$ 113,694.27
Rock and Gravel Surfacing	3,689.96	2,936.33	6,626.29
Production of Betterment Materials	.....	173,219.11	173,219.11
Grading and Roadbed Widening	32,072.09	192,354.45	224,426.54
Bridge Betterment	78,566.81	48,384.24	126,951.05
Bank Protection and Stream Control	10,206.85	5,196.60	15,403.45
Total for Major Betterment	$ 230,979.51	$ 429,341.20	$ 660,320.71

TABLE XVI

EXPENDITURES FOR MAINTENANCE CLASSIFIED AS TO KINDS OF WORK

December 1, 1926, to November 30, 1928.

The expenditures listed in this table are a repetition of the expenditures listed in Table XI, where special maintenance expenditures are classified by projects, and of the expenditures listed in Table XIV, where general maintenance expenditures are classified by counties.

Classification	Expended Dec. 1, 1926 to Nov. 30, 1927	Expended to Nov. 30, Dec. 1, 1927 1928	Total Expenditures 1927-1928 Biennium
GENERAL MAINTENANCE			
Concrete Pavement	$ 9,702.10	$ 13,409.71	$ 23,111.81
Bituminous Pavement	137,698.73	142,467.42	280,166.15
Concrete Shoulders to Bituminous Pavements	505.23	353.32	858.55
Rock Shoulders to Pavements	60,005.96	49,346.95	109,352.91
Oiled Rock or Gravel Surface:			
(a) New oiling	316,557.00	236,917.10	553,474.10
(b) Reoiling	242,095.00	387,645.46	629,740.46
(c) Maintenance of Oiled Surface	264,908.68	316,447.28	581,355.96
Rock and Gravel Surface:			
(a) Ordinary Maintenance	362,564.42	325,520.78	688,085.20
(b) Unusual Maintenance	56,526.67	81,545.48	138,072.15
Roadbed and Right of Way:			
(a) General Maintenance	275,879.30	267,997.85	543,877.15
(b) Removal of Slides	162,941.49	150,445.44	313,386.93
(c) Cutting and Burning Weeds	38,832.66	45,904.86	84,737.52
(d) Guard Fence	20,140.02	13,781.88	33,921.90
Bridges	67,094.38	94,398.70	161,493.08
Snow Removal	135,237.00	137,816.26	273,053.26
Traffic Strips and Road Signs	19,803.02	18,271.03	38,074.05
General Superintendence	98,001.77	117,298.37	215,300.14
Miscellaneous	45,997.44	24,704.19	70,701.63
Total for General Maintenance	$2,314,490.87	$2,424,272.08	$4,738,762.95
SPECIAL MAINTENANCE			
Resurfacing	$ 239,341.86	$ 344,837.47	$ 584,179.33
Production of Maintenance Materials:			
(a) For Bituminous Pavement Repair	7,777.76	.....	7,777.76
(b) For Maintenance of Pavement Shoulders	.....	15,881.46	15,881.46
(c) For Maintenance of Bituminous Macadam	25,951.49	27,352.72	53,304.21
(d) For Maintenance of Oiled Macadam	333,929.04	315,660.36	649,589.40
(e) For Maintenance of Rock Surfacing	174,451.48	132,445.60	306,897.08
Bank Protection and Stream Control	7,545.53	.....	7,545.53
Bridges	3,529.06	4.84	3,533.90
Total for Special Maintenance	$ 792,526.22	$ 836,182.45	$1,628,708.67

TABLE XVII

EXPENDITURES FOR OPERATION OF DRAW BRIDGES AND FERRIES

December 1, 1926, to November 30, 1928

DRAW BRIDGES:		
Young's Bay Bridge near Astoria	$ 5,799.19	
Lewis and Clark River Bridge near Astoria	5,977.49	
Coquille River Bridge at Coquille	677.37	
Siletz River Bridge near Taft	3,129.42	
Interstate Bridge at Vancouver	50.00	
Total for Draw Bridge Operation		$15,633.47
FERRIES:		
Coos Bay Ferry at North Bend	$12,974.23	
Rogue River Ferry at Wedderburn	15,203.59	
Bagwell Ferry near Gold Beach	406.10	
Total for Ferry Operation		28,583.92
Total for Draw Bridges and Ferries		$44,217.39

TABLE XVIII

EXPENDITURES IN CONNECTION WITH EQUIPMENT AND SUPPLIES

December 1, 1926, to November 30, 1928

This statement is a summary of the transactions handled through the equipment and supplies holding account. All expense in connection with equipment and supplies is charged against this account in the first instance, but is later charged out to the various classes and subdivisions of construction and maintenance work in the form of rentals, service charges, etc., leaving in the holding account only such small amount as may be undistributed at the end of the year.

CHARGES:		
Purchase of Equipment	$ 431,032.18	
Purchase of Repair Parts, Supplies and Materials	890,625.87	
Purchase of Construction and Maintenance Materials and Supplies	911,595.77	
Labor Employed in the Upkeep of Equipment and in the Handling of Equipment Supplies	491,204.15	
Improvement and Upkeep of Buildings and Grounds	13,058.57	
Insurance on Stock and Equipment	16,969.88	
Power, Light, Heat and Water	17,227.90	
Purchase of Site and Erection of Shops at La Grande	53,677.59	
Gross Total of Charges		$2,825,391.91
CREDITS:		
Credits from Rental of Equipment	$1,172,871.13	
Credits for Materials, Repair Parts and Supplies Furnished	1,531,232.16	
Credits for Labor Furnished	74,880.44	
Credits for Salvaged Materials and Equipment Sold	1,485.00	
Gross Total of Credits		2,780,468.73
Net Charge		$ 44,923.18

TABLE XIX

EXPENDITURES FOR PARKS AND TIMBER PRESERVATIONS

December 1, 1926, to November 30, 1928

COUNTY AND NAME OR LOCATION	Amount Expended
BAKER COUNTY	
Park site six miles south and east of Unity	$ 180.81
Park site 30 miles east of Baker	96.64
CLATSOP COUNTY	
Bradley Park at Clatsop Crest (near Westport)	1,961.82
CURRY COUNTY	
Park site at Hunters Head (south of Port Orford)	106.34
Harris Park north of Brookings	29.53
Timber preservation 11 miles north of Gold Beach	233.50
Battle Rock Park at Port Orford	1,200.00
DESCHUTES COUNTY	
Lava River Caves Park 11 miles south of Bend	2,986.69
Pilot Butte Park at Bend	4,027.35
Park site one mile north of Bend	82.96
HOOD RIVER COUNTY	
Viento Park east of Cascade Locks	3,823.73
Timber preservation two miles east of Hood River	2,269.51
JEFFERSON COUNTY	
Ogden Park at Crooked River Crossing north of Redmond	7,678.24
LAKE COUNTY	
Chandler Park sixteen miles north of Lakeview	98.74
LANE AND BENTON COUNTIES	
Park site between Junction City and Monroe	279.58
LINCOLN COUNTY	
Otter Crest Park 10 miles north of Newport	1,115.09
Rocky Creek Park 11 miles north of Newport	10.00
Devils Punch Bowl Park 8 miles north of Newport	1,064.13
Park site at Yachats	6,255.50
POLK COUNTY	
Sarah Helmick Park six miles south of Monmouth	453.64
UMATILLA COUNTY	
Park at Emigrant Springs near Meacham	28,933.40
Timber preservations Emigrant Hill-Union County line	38,718.45
UNION COUNTY	
Timber preservations near Kamela	4,798.80
Timber preservations near Minam	7.10
Gangloff Park one mile north of La Grande	461.90
WALLOWA COUNTY	
Timber preservations near Minam	1,402.62
WASCO COUNTY	
Mayer Park at Rowena Loops	40.40
Memaloose Park two miles east of Mosier	36.67
WHEELER COUNTY	
Shelton Park 11 miles south of Fossil	829.98
Total	$109,183.12

TABLE XX

EXPENDITURES FOR EXTRA RIGHT OF WAY, QUARRY SITES AND MAINTENANCE PATROL STATIONS

December 1, 1926, to November 30, 1928

EXTRA RIGHT OF WAY	
Extra Right of Way at Junction West of Unity	$ 155.15
Extra Right of Way, Haines-Baker Section	615.69
Extra Right of Way, Mt. Hood Highway in Clackamas County	3,404.99
Extra Right of Way, Oregon City-Canemah Section	200.19
Extra Right of Way, Canemah-Aurora Section	3,429.79
Extra Right of Way, Astoria-Seaside Section	146.85
Extra Right of Way in Columbia County	755.00
Right of Way at Buffington Property North of Gold Beach	2,917.19
Right of Way for Dike South of Yoncalla	50.00
Extra Right of Way at Gold Hill	1,000.00
Right of Way Markers, Albany-Lebanon Section	455.97
Extra Right of Way at Hebo	276.12
Extra Right of Way at Junction East of Pendleton	75.00
Extra Right of Way, Kamela-La Grande Section	975.00
Extra Right of Way, La Grande-Hot Lake Section	29.61
Right of Way on Toll Bridge Cut-off East of The Dalles	150.00
Right of Way, Beaverton-Multnomah County Line Section	34,266.98
Total for Extra Right of Way	$ 48,903.53
QUARRY SITES	
Blodgett Quarry and Park Site near Blodgett	$ 49.90
Rogue River Gravel Pit near Wedderburn	828.00
Colebrook Quarry near Euchre Creek	300.00
Quarry Site Five Miles East of Sisters	407.00
Geo. W. Short Quarry Site near Wilbur	540.00
Ford Gravel Pit North of Lakeview	4.40
Wright Quarry at Seal Rocks North of Waldport	1,207.00
Quarry Property at Yachats	402.00
Sturgiss Quarry West of Pendleton	322.43
Gravel Pit Five Miles West of Wapinitia	665.00
Total for Quarry Sites	$ 4,725.73
MAINTENANCE PATROL STATIONS	
Maintenance Patrol Station at Corvallis	$ 1,528.15
Maintenance Patrol Station at Canemah	1,347.94
Maintenance Patrol Station at Government Camp	6,532.16
Maintenance Patrol Station at Sandy	690.00
Bridge Equipment Station at Coquille	281.39
Maintenance Patrol Station at Prineville	3,104.31
Maintenance Patrol Station at Bend	4,737.26
Maintenance Patrol Station at Austin Junction	264.97
Maintenance Patrol Station at Green Springs	128.50
Maintenance Patrol Station at Sand Creek	1,358.14
Maintenance Patrol Station at Chemult	13,027.12
Maintenance Patrol Station at Paisley	145.69
Maintenance Patrol Station at Lakeview	1,555.30
Maintenance Patrol Station at Goldson	4,881.12
Maintenance Patrol Station at Burnt Woods	102.25
Maintenance Patrol Station 11 Miles East of Huntington	2,356.56
Maintenance Patrol Station at Ontario	676.75
Maintenance Patrol Station at Athena	1,382.96
Maintenance Patrol Station at Meacham	15,829.54
Office Building at La Grande	7,689.42
Maintenance Patrol Station at Willamina	168.00
Total for Maintenance Patrol Stations	$ 67,787.53
Total for Extra Right of Way, Quarry Sites and Maintenance Patrol Stations	$121,416.79

TABLE XXI

EXPENDITURES FOR SURVEYS

December 1, 1926, to November 30, 1928

In this table are listed the amounts expended by the State Highway Commission for surveys on state highway routes.

COUNTY AND SECTION OF HIGHWAY	Amount Expended
BAKER	
Middle Bridge-Richland Section, revision	$ 400.48
Halfway to Carson Section, location	402.04
CLACKAMAS COUNTY	
Canemah-Canby Section, revision	3,108.77
Oswego-Multnomah County Line Section, revision	736.78
CLATSOP COUNTY	
Big Noise Creek-Rock Creek Section, revision	384.23
Big Creek Section, revision	655.04
COLUMBIA COUNTY	
Clatskanie-Clatsop County Line Section, revision	256.61
COOS COUNTY	
Larson Slough and Haynes Slough Section, revision	395.11
Lakeside Undercrossing Section, location	141.62
CURRY COUNTY	
Approaches to Rogue River Ferry, location	897.73
DESCHUTES COUNTY	
Bend-North Section, revision	377.77
DESCHUTES AND HARNEY COUNTIES	
Millican-Sage Hen Hill Section, location	8,351.30
DOUGLAS COUNTY	
Roosevelt Coast Highway across County, relocation	6,407.07
Rice Hill-Oakland Section, location	1,304.81
Reedsport Section, location	1,138.28
GILLIAM COUNTY	
Section West of Arlington, revision	279.14
GRANT COUNTY	
Forest Boundary-John Day Section, location	3,461.89
Dale-Long Creek Section, reconnaissance	116.59
HARNEY COUNTY	
Lake County Line-Burns (Lakeview-Burns Road), preliminary	166.56
Buchanan-Vanderveer Section, location	4,026.79
JACKSON COUNTY	
Gold Hill-Medford Section, revision	1,457.47
JOSEPHINE COUNTY	
Grants Pass-Applegate River Section, location	82.50
Applegate River-George Ranch Section, location	163.40
Wolf Creek-Grave Section, revision	2,867.02
Grants Pass-Jackson County Line Section, revision	620.86
KLAMATH COUNTY	
Jackson County Line-Klamath Falls Section, revision	49.84
Bly-Forest Boundary Section, relocation	946.97
Dairy-Bly Mountain Section, relocation	2,534.64
Klamath Falls-Lakeview Junction Section, revision	1,022.55

TABLE XXI—Continued

COUNTY AND SECTION OF HIGHWAY	Amount Expended
LAKE COUNTY	
Lakeview-New Pine Creek Section, location	1,658.86
Paisley-Summer Lake Section, location	1,660.20
Lapine-Picture Rock Pass Section, location	9,277.34
Picture Rock Pass-Hunter Hill Section, location	3,184.18
Lakeview-Harney County Line Section (Lakeview-Burns Road), preliminary	1,590.63
LANE COUNTY	
Douglas County Line-Florence Section, relocation	1,489.18
Springfield-Blue River Section, location	3,882.16
Thompson Creek-McLeod Creek Section, location	61.50
North Fork Mountain Section, location	3,691.96
Lowell-Oakridge Section, location	8,711.18
Cheshire-Junction City Section, location	516.61
Springfield Lane-Cogswell Hill Section, relocation	448.85
LINCOLN COUNTY	
Newport-Waldport Section, relocation	5,077.44
Waldport-Yachats Section, relocation	1,163.68
Rocky Creek Bridge, site survey	40.38
Newport-Waldport Section, prospecting for surfacing materials	671.11
LINN COUNTY	
Shea's Hill-Cascadia Section, location	165.28
Lebanon-Shea's Hill Section, location	5,040.01
Relocation through the "Narrows" near Sweet Home	582.52
MALHEUR COUNTY	
Harper-Burrell Ranch Section, location	601.98
Harper-Burns Section, reconnaissance	2,631.67
Jamieson-Vale Section, revision	820.88
POLK COUNTY	
New Grand Ronde-Old Grand Ronde Section, location	580.72
Valley Junction Section, revision	320.70
TILLAMOOK COUNTY	
Hobsonville-Mohler Section, location	834.48
Tillamook-Forest Grove Section (Wilson River Route), location	4,866.01
Salmon River-Dolph Section, location	2,134.11
UMATILLA COUNTY	
Emigrant Hill-Dead Man's Pass Section, revision	149.50
Nolin Section, revision	1,276.57
UNION COUNTY	
Elgin-East Section, revision	472.10
Umatilla County Line-Hilgard Section, revision	2,389.10
Weston-Elgin Section, reconnaissance	59.16
WALLOWA COUNTY	
Flora-Washington State Line Section, reconnaissance	281.06
WASHINGTON COUNTY	
Beaverton-Multnomah County Line Section, revision	2,557.15
Tualatin River Bridge Section, revision	422.84
WHEELER COUNTY	
Mitchell-Dayville Section, relocation	4,840.32
YAMHILL COUNTY	
Sheridan-Willamina Section, revision	841.23
Total	$117,746.51

TABLE XXII

EXPENDITURES FOR CONSTRUCTION ENGINEERING ON COUNTY WORK

December 1, 1926, to November 30, 1928

The expenditures included in this table are for engineering work in connection with construction work performed by county forces or under county contracts. Only those expenditures for which the state is not to be reimbursed or has not yet been reimbursed by the counties are included.

COUNTY AND SECTION OF HIGHWAY	Amount Expended
BAKER	
County bridges	$ 1,461.43
JOSEPHINE COUNTY	
O'Brien School-Waldo	1,028.91
LAKE COUNTY	
Lakeview-New Pine Creek	775.51
Summer Lake-Ana Spring	774.31
LINCOLN COUNTY	
Grande Ronde-Otis (Salmon River Road)	Cr. 5,901.10*
MARION COUNTY	
Commercial St. Bridge over Mill Creek in Salem	101.16
POLK COUNTY	
Tillamook County Line-Grande Ronde	Cr. 39.00*
Falls City-Siletz-Newport Improvement District	62.95
UMATILLA COUNTY	
Lazinka Ranch-Albee	3,418.29
Total	$ 1,682.46

* This credit represents a reinbursement of the state by the county for construction enginering expenditures made during the previous biennium.

TABLE XXIII

EXPENDITURES FOR GENERAL AND MISCELLANEOUS PURPOSES

December 1, 1926, to November 30, 1928

In this table are listed all expenditures that are not covered in the tables preceding. The expenditures included in it are those which can not be charged out to projects, but which must be carried as general expense. They consist of expenditures in payment of interest and maturities on bonds, expenditures for administration and general supervision of the state highway work, expenditures for enforcement of traffic laws, and expenditures for miscellaneous purposes.

ADMINISTRATION AND GENERAL SUPERVISION

General Administration	$ 27,940.72
State Highway Commission	8,586.73
Legal Department	26,363.22
Auditing Department	40,859.82
Office of Chief Clerk	17,243.53
Office Engineering Department	59,019.08
Bridge Engineering Department	56,596.57
Materials Testing Department	13,234.99
State Highway Engineer	18,073.17
Maintenance Department	26,859.46
Division Office No. 1, Salem	17,894.33
Division Office No. 2, Salem	17,910.01
Division Office No. 3, Grants Pass	25,742.63
Division Office No. 4, Bend	27,390.02
Division Office No. 5, La Grande	26,101.85
Total	$ 409,816.13

INTEREST AND MATURITIES ON BONDS

Interest on Bonds	$3,249,276.86
Maturities on Bonds	3,350,000.00
Total	$6,599,276.86

ENFORCEMENT OF TRAFFIC LAWS

Total for this item	$ 123,390.01

MISCELLANEOUS GENERAL EXPENSE

Mileposting The Dalles-California Highway	$ 3,803.20
Mileposting Coos Bay-Roseburg Highway (preliminary work)	559.16
Mileposting Crater Lake Highway (preliminary work)	374.93
Investigating Effect of Heavy Truck Traffic on Highways	1,019.28
Rogue River Bridge Experimental Work	375.70
Paint Investigation by Bridge Department	25.80
Special Analyses of Materials in Bituminous Macadams	794.00
Stucco Investigation by Bridge Department	344.00
Testing of Diatomite Concrete Mixtures	169.50
Operation of Highway Magnet	3,508.90
Surveys to Determine Kind and Volume of Highway Traffic	15,988.31
Publication of 1925-1926 Biennial Report	5,134.03
Publication of Road Maps	1,485.60
Contributions to State Restoration Fund (fire insurance)	661.31
Special Litigation Not Chargeable to Particular Projects	50.10
Expense of Advisory Committee on Parks and Highway beautification	655.27
Industrial Accident Insurance Holding Account Cr.	11.93
Maintenance Patrolmen's Badge Account Cr.	1.70
Receipt from Telephone Company for Use of Albany Bridge to Support Cables Cr.	200.00
Damage Claims Ordered Paid by Legislature	500.00
Maintenance of Foster & Kleiser Signs at Entry to State	533.40
Credits Account of Unclaimed Warrants Cr.	76.26
Credits for Unclaimed or Uncashed Payroll Checks Cr.	831.24
Totals	$ 34,861.36

TABLE XXIV

MARKET ROAD RECEIPTS AND DISBURSEMENTS

December 1, 1926, to November 30, 1928

The receipts and disbursements listed in this table are the actual receipts and disbursements during the fiscal period December 1, 1926, to November 30, 1928. They are not the receipts and disbursements for the tax years 1927 and 1928. For receipts and disbursements for the tax years 1927 and 1928, see page 64 and the market road tables in Part Four.

County	Receipts From State Market Road Tax	Disbursements	
		Cash Payments to Counties	Advances to Counties in Service, Materials and Supplies
Baker	$ 45,870.42	$ 61,457.67	$ 267.87
Benton	32,274.63	45,054.87	Cr. .44
Clackamas	100,932.01	138,530.46	903.16
Clatsop	55,601.03	77,921.94	Cr. 2.48
Columbia	35,899.61	43,931.16	8.00
Coos	66,402.00	92,684.93	----
Crook	11,389.02	15,827.43	11.79
Curry	10,661.55	14,146.79	1,437.87
Deschutes	25,380.35	32,027.70	3,323.71
Douglas	63,504.12	85,156.57	3,435.01
Gilliam	19,550.84	25,833.24	1,640.81
Grant	14,865.56	20,756.37	----
Harney	17,376.20	22,514.36	6,223.63
Hood River	20,271.71	28,306.08	----
Jackson	60,373.89	104,792.07	----
Jefferson	13,353.63	18,638.26	----
Josephine	15,916.86	20,901.39	1,627.47
Klamath	41,430.82	74,316.69	4.00
Lake	20,267.82	28,215.98	1,445.79
Lane	98,297.77	137,007.00	1,149.12
Lincoln	17,583.48	24,551.20	20.00
Linn	66,224.12	92,467.41	----
Malheur	25,709.35	45,677.31	----
Marion	121,573.62	134,985.29	Cr. 482.61
Morrow	21,858.53	25,254.83	1,624.18
Multnomah	800,136.13	219,218.36	----
Polk	47,803.94	66,673.90	3.73
Sherman	15,043.05	28,057.67	----
Tillamook	44,776.86	60,043.17	565.27
Umatilla	93,450.71	127,274.57	572.74
Union	49,130.61	68,576.38	----
Wallowa	23,108.68	32,262.22	----
Wasco	36,343.12	50,742.23	----
Washington	70,685.62	98,672.87	9.75
Wheeler	9,221.64	9,941.06	4,164.15
Yamhill	47,232.12	62,601.47	----
Sub-totals	$2,259,501.42	$2,235,020.90	$ 27,952.52
Bal. on hand, December 1, 1926	13,905.32	----	----
Expended for administration and supervision	----	----	31,307.92
Totals	$2,273,406.74	$2,235,020.90	$ 59,260.44

The amounts given in the above statement do not include $22,584.29 disbursed by Harney county in connection with contract market road work on the Nigger Flat-Vanderveer section of the Burns-Drewsey Market Road, which disbursement by reason of the work having been supervised by the Highway Department was recorded in the Highway Department's books.



TOP—BRIDGE OVER EUCHRE CREEK NORTH OF WEDDERBURN; CENTER—BRIDGE OVER HUNTERS CREEK SOUTH OF GOLD BEACH; BOTTOM—BRIDGE OVER CLEAR CREEK SOUTH OF SELMA

PART FOUR

Statistical Information

Pertaining to

State Highways and County Roads

in the

State of Oregon

INDEX TO TABLES

		Page
Table No. 1.	Mileages of Highways Improved and Maintained, 1913 to 1928	130
Table No. 2.	Expenditures in connection with State Highway Improvement and Maintenance, 1917 to 1928	131
Table No. 3.	State Funds Received and Expended, 1917 to 1928	131
Table No. 4.	Incomes from Different Sources, 1917 to 1928	132
Table No. 5.	Expenditures for Different Purposes, 1917 to 1928	134
Table No. 6.	Construction Expenditures Classified by Counties, 1917 to 1928	136
Table No. 7.	Construction Expenditures Classified by Highways, 1917 to 1928	137
Table No. 8.	Maintenance Expenditures Classified by Counties, 1917 to 1928	138
Table No. 9.	Maintenance Expenditures Classified by Highways, 1917 to 1928	139
Table No. 10.	Forest Road Expenditures Classified by Counties, 1917 to 1928	140
Table No. 11.	Forest Road Expenditures Classified by Highways, 1917 to 1928	141
Table No. 12.	Statistics Pertaining to Forest Road Work, 1917 to 1928	142
Table No. 13.	Forest Highway Work Performed, 1927-1928	143
Table No. 14.	County Bond Issues for Road Purposes, 1913 to 1928	144
Table No. 15.	County Disbursements for Road Purposes, 1921 to 1928	146
Table No. 16.	Motor Vehicle Registrations and Revenues, 1913 to 1928	147
Table No. 17.	Mileages of State Highways Classified by Counties	148
Table No. 18.	Mileages of County Roads	149
Table No. 19.	Mileages of Highway Improvement Classified by Highways	150
Table No. 20.	State Highway Equipment Account	151
Table No. 21.	Condensed Inventory of Equipment, Shops and Warehouses	151
Table No. 22.	Inventory of Heavy State-owned Equipment	152
Table No. 23.	Mileages of Work Performed, 1927-28, Classified by Sections	154
Table No. 24.	Mileages of Surveys, 1927-28	160
Table No. 25.	Bridge Design and Bridge Construction, 1927-28	162
Table No. 26.	Bridge Designs Prepared for Counties, 1927-28	165
Table No. 27.	Market Road Apportionments, 1920 to 1928	167
Table No. 28.	Market Road Apportionment, 1927	168
Table No. 29.	Market Road Apportionment, 1928	169
Table No. 30.	Market Road Receipts and Expenditures, 1927	170
Table No. 31.	Market Road Receipts and Expenditures, 1928	171
Table No. 32.	Market Road Receipts and Classification of Expenditures, 1927-28	172
Table No. 33.	Market Road Receipts and Classification of Expenditures, 1920 to 1928	173
Table No. 34.	Apportionment of Multnomah County's Surplus Market Road Funds, 1920 to 1928	174
Table No. 35.	Market Road Advances to Counties, 1920 to 1928	175
Table No. 36.	Expenditures by Counties Under Market Road Act, 1920 to 1928	176
Table No. 37.	Maintenance Expenditures on Market Roads, 1925 to 1928	177
Table No. 38.	Mileages of Construction Under Market Road Act, 1920 to 1928	178
Table No. 39.	Mileages in County Market Road Systems	179
Table No. 40.	Park Sites Acquired by Highway Commission	180
Table No. 41.	Rights-of-way Acquired by Highway Commission	186
Table No. 42.	Stock Pile and Storage Sites Acquired	191
Table No. 43.	Rock Quarries and Gravel Pits Acquired	198
Table No. 44.	Patrol Station Site, Shop Sites, Etc., Acquired	208
Table No. 45.	Volume of Travel to Crater Lake and to the Oregon Caves	211
Table No. 46.	Results of State Highway Traffic Counts, 1927 and 1928	212
Table No. 47.	Comparison of State Highway Traffic Counts, 1923 to 1928	220

TABLE No. 1

RECORD OF MILEAGE OF VARIOUS CLASSES OF HIGHWAY IMPROVEMENT AND MAINTENANCE WORK PERFORMED UNDER THE SUPERVISION OF THE STATE HIGHWAY COMMISSION

The mileages given in these tables include all state and county cooperative work, all federal aid work, and such county work on state highways as has been paid for on vouchers drawn by the State Highway Department. Forest road work and work performed by county forces or under county contracts is not included.

NEW CONSTRUCTION

Year	Bituminous Pavement (Miles)	Concrete Pavement (Miles)	Bituminous Macadam Wearing Surface (Miles)	Rock and Gravel Surfacing (Miles)	Grading (Miles)
1913–1916	7.3	14.3	.....	19.8	160.2
1917–1918	45.2	4.8	.....	111.8	134.5
1919	144.6	18.5	.....	87.0	277.3
1920	167.7	16.4	.....	264.0	402.8
1921	125.0	51.0	.....	433.9	449.7
1922	55.2	33.4	.....	364.4	334.6
1923	5.2	15.6	.....	378.8	243.9
1924	.....	15.9	.....	201.7	171.1
1925	0.6	7.6	.....	146.1	177.2
1926	0.2	.....	.....	129.8	139.8
1927	.....	0.8	3.3	136.0	79.4
1928	.....	.....	104.3	73.8	68.3
Totals	551.0	178.3	107.6	2,347.1	2,638.8

RECONSTRUCTION AND BETTERMENT

Year	Pavement Resurfacing and Widening (Miles)	Rock and Gravel Resurfacing (Miles)	Rock Surface Oiling (Miles)	Grade Widening (Miles)
1921	5.0	.....	.....	.....
1922	9.3	24.2	.....	49.6
1923	15.6	38.5	15.9	12.7
1924	.....	127.5	55.2	20.8
1925	0.8	68.9	160.1	15.7
1926	8.4	40.1	343.6	9.9
1927	.....	68.6	379.5	17.0
1928	.....	86.1	240.1	15.9
Totals	39.1	453.0	1,194.4	141.6

MAINTENANCE

Year	Bituminous Pavement (Miles)	Concrete Pavement (Miles)	Bituminous Macadam Surfacing (Miles)	Oiled Rock Surfacing (Miles)	Unoiled Rock Surfacing (Miles)	Graded Earth Roads (Miles)	Total (Miles)
1919	55	20	.....	.....	130	95	300
1920	195	40	.....	.....	200	315	750
1921	365	55	.....	.....	450	430	1,300
1922	485	105	.....	.....	850	410	1,850
1923	540	145	.....	8	1,192	365	2,250
1924	545	160	.....	44	1,456	245	2,450
1925	544	170	.....	151	1,551	158	2,574
1926	545	171	.....	403	1,552	174	2,845
1927	537	188	2	766	1,440	246	3,179
1928	536	189	30	1,071	1,366	173	3,366

TABLE No. 2

YEARLY EXPENDITURES ON WORK HANDLED UNDER THE SUPERVISION OF THE STATE HIGHWAY COMMISSION

Years 1917 to 1928

Year	State Funds	County Funds	Government Funds	Miscellaneous Contributors' Funds	Totals
1917 ..	$ 674,249.61	$ 270,162.37	$	$	$ 944,411.98
1918 ..	2,214,007.87	439,562.42	.....	.....	2,653,570.29
1919 ..	6,248,304.16	368,550.01	224,851.60	.....	6,841,705.77
1920 ..	11,381,606.97	868,539.59	1,096,627.33	17,661.62	13,363,835.51
1921 ..	15,000,824.65	985,831.42	2,181,956.65	46,378.16	18,214,990.88
1922 ..	7,724,688.96	3,814,402.13	1,043,695.07	33,341.49	12,616,127.65
1923 ..	7,287,991.77	2,199,707.40	1,719,088.71	129,634.73	11,336,422.61
1924 ..	6,916,867.91	1,586,176.49	1,118,777.53	94,241.61	9,716,063.54
1925 ..	10,611,283.45	1,327,243.26	1,327,328.92	62,500.74	13,328,356.37
1926 ..	7,927,130.75	715,701.37	1,264,688.74	78,916.59	9,986,437.45
1927 ..	8,474,609.91	618,679.22	1,111,521.64	58,632.08	10,263,442.85
1928 ..	8,975,204.79	683,625.95	582,440.20	26,973.39	10,268,244.33
Totals	$93,436,770.80	$13,878,181.63	$11,670,376.39	$548,280.41	$119,533,609.23

TABLE No. 3

STATE FUNDS RECEIVED AND EXPENDED BY THE STATE HIGHWAY COMMISSION, 1917 to 1928

Year	Net Receipts (State Funds Only)	Net Expenditures
1917 (Including $94,418.14 from 1916)	$ 1,802,190.22	$ 674,249.61
1918	1,759,600.15	2,214,007.87
1919	7,458,614.05	6,248,304.16
1920	11,320,354.05	11,381,606.97
1921	13,550,136.40	15,000,824.65
1922	9,608,966.45	7,724,688.96
1923	7,664,977.79	7,287,991.77
1924	6,115,536.48	6,916,867.91
1925	*10,231,908.30	†10,611,283.45
1926	7,345,080.19	7,927,130.75
1927	8,627,279.00	8,474,609.91
1928	8,721,396.09	8,975,204.79
Totals	$94,206,039.17	$93,436,770.80
Balance on hand December 1, 1928	.....	769,268.37
Totals	$	$94,206,039.17

* Includes $3,011,805 received from the sale of refunding bonds.

† Includes $3,000,000 used to refund short term bonds.

TABLE No. 4

SCHEDULE OF YEARLY INCOMES FROM DIFFERENT SOURCES—1917 TO 1928, INCLUSIVE

Source of Income	1917-1919 Inclusive	1920	1921	1922	1923	1924
Balance on hand December 1, 1916	$ 94,418.14	$	$	$	$	$
Bond sales (including accrued interest)	8,814,039.52	9,170,196.50	10,957,359.33	6,265,544.02	2,489,875.00	
Motor vehicle license fees	1,107,418.83	1,481,122.75	1,624,983.02	2,358,987.02	2,902,476.56	3,419,808.55
Gasoline and distillate tax	290,795.49	404,050.16	948,509.66	944,310.46	1,975,174.23	2,358,277.17
One-quarter mill property tax	698,725.84	247,608.87			246,452.30	255,863.20
Interest on bank balances	15,006.60	17,375.77	19,284.39	40,124.95	48,084.45	62,047.49
Fines for traffic law violations					2,915.25	19,540.07
Subtotals (all state funds)	$11,020,404.42	$11,320,354.05	$13,550,136.40	$ 9,608,966.45	$ 7,664,977.79	$ 6,115,536.48
County cooperation	1,078,274.80	868,539.59	985,831.42	3,814,402.13	2,199,707.40	1,586,176.49
Federal government cooperation	224,851.60	1,096,027.33	2,181,956.65	1,043,695.07	1,719,088.71	1,118,777.53
Miscellaneous cooperation		17,661.62	46,378.16	33,341.49	129,634.73	94,241.61
Totals	$12,323,530.82	$13,302,582.59	$16,764,302.63	$14,500,405.14	$11,713,408.63	$ 8,914,732.11

TABLE No. 4—Continued

SCHEDULE OF YEARLY INCOMES FROM DIFFERENT SOURCES—1917 TO 1928, INCLUSIVE

Source of Income	1917-1924 Inclusive	1925	1926	1927	1928	Totals Period 1917-1928
Balance on hand December 1, 1916	$ 94,418.14	$	$	$	$	$ 94,418.14
Bond sales (including accrued interest)	37,697,014.37	*3,011,805.00				*40,708,819.37
Motor vehicle license fees	12,894,796.73	3,788,533.19	4,260,000.00	4,620,000.00	4,926,609.20	30,489,939.12
Gasoline and distillate tax	6,921,117.17	3,073,068.11	3,013,149.20	3,887,655.24	3,657,288.38	20,552,278.10
Motor transportation fees				49,854.21	98,302.35	148,156.56
One-quarter mill property tax	1,448,650.21	275,382.12				1,724,032.33
Interest on bank balances	201,923.65	57,601.02	38,372.94	46,053.35	19,939.31	363,890.27
Fines for traffic violations	22,455.32	25,518.86	33,558.05	23,716.20	19,256.85	124,505.28
Subtotals (all state funds)	$ 59,280,375.59	$ 10,231,908.30	$ 7,345,080.19	$ 8,627,279.00	$ 8,721,396.09	$ 94,206,039.17
County cooperation	10,532,931.83	1,327,243.26	715,701.37	618,679.22	683,625.95	13,878,181.63
Federal government cooperation	7,384,396.89	1,327,328.92	1,264,688.74	1,111,521.64	582,440.20	11,670,376.39
Miscellaneous cooperation	321,257.61	62,500.74	78,916.59	58,632.08	26,973.39	548,280.41
Totals	$ 77,518,961.92	*$12,948,981.22	$ 9,404,386.89	$ 10,416,111.94	$ 10,014,435.63	$120,302,877.60

* Includes $3,011,805 received and disbursed in connection with the refu nding of $3,000,000 of short term bonds.

TABLE No. 5

SCHEDULE OF YEARLY EXPENDITURES—1917 TO 1928, INCLUSIVE

The expenditures in this table include all expenditures in connection with work handled under the direct supervision of the State Highway Department. They do not include federal government and county expenditures on forest highway work, and they do not include expenditures in connection with market road work.

Classification of Expenditures	1917-1919 Inclusive	1920	1921	1922	1923	1924
New construction	$ 8,973,343.04	$11,698,088.88	$15,905,930.00	$ 9,340,261.39	$ 6,685,465.67	$ 4,906,783.90
Major additions and betterments				80,723.22	617,478.34	140,412.36
Special maintenance			55,383.37	158,743.75	265,748.64	625,740.80
Cooperation on forest roads	281,022.16	528,239.42	418,097.62	306,872.91	662,360.17	430,300.14
Minor additions and betterments				123,180.84	207,721.11	182,766.62
General maintenance	16,346.30	94,667.82	544,508.82	618,095.68	784,779.23	1,041,028.78
Rights of way, patrol stations, etc.				13,862.29	10,979.65	Cr. 3,183.22
Operation of draw bridges and ferries			911.29	3,668.37	6,042.85	5,844.81
Parks and timber preservations				1,211.58	5,894.32	14,153.86
Enforcement of traffic laws				14,791.16	18,975.16	27,848.33
Equipment and supplies (holding account)	299,762.39	80,555.76	Cr. 73,002.52	Cr. 29,951.94	Cr. 88,733.70	Cr. 54,767.58
Retirement of bonds				125,000.00	179,750.00	334,500.00
Interest and other bond expense	228,921.68	506,583.10	981,676.98	1,526,956.39	1,744,509.64	1,824,340.00
Administration and general supervision	244,375.21	203,933.77	229,888.59	175,622.76	172,293.69	164,123.22
Surveys	359,855.38	188,402.90	123,432.29	124,607.32	46,880.27	54,622.51
Engineering county construction	36,260.00	63,525.62	28,317.48	9,259.25	2,964.44	419.09
Miscellaneous general expense	Cr. 198.12	Cr. 161.76	Cr. 153.04	23,222.68	13,313.13	21,129.92
Totals	$10,439,688.04	$13,363,835.51	$18,214,990.88	$12,616,127.65	$11,336,422.61	$ 9,716,063.54

TABLE No. 5—Continued

SCHEDULE OF YEARLY EXPENDITURES—1917 TO 1928, INCLUSIVE

The expenditures in this table include all expenditures in connection with work handled under the direct supervision of the State Highway Department. They do not include federal government and county expenditures on forest highway work, and they do not include expenditures in connection with market road work.

Classification of Expenditures	1917-1924 Inclusive	1925	1926	1927	1928	Totals Period 1917-1928
New construction	$ 57,509,872.88	$ 4,114,332.38	$ 3,744,425.85	$ 2,719,745.06	$ 1,983,788.75	$ 70,072,164.92
Major additions and betterments	838,613.92	255,571.49	367,037.92	230,979.51	429,341.20	2,121,544.04
Special maintenance	1,105,616.56	390,257.90	374,244.72	792,526.22	836,182.45	3,498,827.85
Cooperation on forest roads	2,626,892.42	587,401.88	172,360.70	147,859.76	103,084.09	3,637,598.85
Minor additions and betterments	513,668.57	163,061.34	148,210.31	221,263.76	721,639.62	1,767,843.60
General maintenance	3,099,426.63	1,669,741.91	1,928,189.78	2,314,490.87	2,424,272.08	11,436,121.27
Rights of way, patrol stations, etc.	21,658.72	8,899.33	22,035.45	43,894.69	77,522.10	174,010.29
Operation of draw bridges and ferries	16,467.32	9,456.28	7,377.18	9,564.62	34,652.77	77,518.17
Parks and timber preservations	21,259.76	14,982.80	20,745.61	31,891.71	77,291.41	166,171.29
Enforcement of traffic laws	61,614.65	35,879.78	50,544.04	57,929.53	65,460.48	271,428.48
Equipment and supplies (holding account)	133,862.41	Cr. 32,906.55	Cr. 32,055.40	115,138.59	Cr. 70,215.41	113,823.64
Retirement of bonds	639,250.00	*3,797,000.00	1,197,000.00	1,600,000.00	1,750,000.00	*8,983,250.00
Interest and other bond expense	6,812,987.79	1,801,819.24	1,722,761.65	1,663,215.87	1,586,060.99	13,586,845.54
Administration and general supervision	1,190,237.24	176,591.53	187,085.86	215,112.26	194,703.87	1,963,730.76
Surveys	897,800.67	92,075.00	65,674.06	69,220.98	48,525.53	1,173,296.24
Engineering county construction	140,745.88	2,970.05	5,894.14	15,252.04	Cr. 13,569.58	151,292.53
Miscellaneous general expense	57,152.81	241,222.01	4,905.58	15,357.38	19,503.98	338,141.76
Totals	$ 75,687,128.23	*$13,328,356.37	$ 9,986,437.45	$ 10,263,442.85	$ 10,268,244.33	$119,533,609.23

* Includes $3,000,000 disbursed in connection with the refunding of short term bonds.

TABLE No. 6

EXPENDITURES FOR CONSTRUCTION WORK CLASSIFIED BY COUNTIES

Years 1917 to 1928, Inclusive

This table gives the totals of the expenditures made for construction work in each of the several counties during the twelve-year period ending November 30, 1928. It includes expenditures for new construction, additions and betterments, surveys and the engineering of county construction. It includes also, state expenditures in connection with forest highway work. It does not include expenditures for maintenance work or the expenditures of the federal government and counties in connection with forest highway construction work.

County	Total Amount Expended	Cooperation in Expenditures			
		By State	By Counties	By Federal Government	By Miscellaneous Contributors
Baker	$ 2,988,465.02	$ 1,470,098.73	$ 1,023,125.09	$ 410,154.57	$ 85,086.63
Benton	2,424,683.53	1,697,236.81	371,451.81	347,374.65	8,620.26
Clackamas	2,538,007.77	1,638,060.21	*573,751.86	236,800.58	89,395.12
Clatsop	3,261,881.79	2,416,900.06	367,473.33	477,508.40	.....
Columbia	2,045,352.68	1,878,892.17	13,762.86	152,697.65	.....
Coos	2,710,224.35	1,418,616.09	825,197.50	452,810.76	13,600.00
Crook	1,013,584.24	695,524.43	232,482.50	85,577.31	.....
Curry	3,488,281.99	2,407,847.91	221,942.72	858,491.36	.....
Deschutes	1,216,049.16	819,643.10	176,836.69	219,569.37	.....
Douglas	7,008,013.24	5,611,899.35	769,309.22	597,360.59	29,444.08
Gilliam	2,024,514.18	1,280,758.51	276,214.72	467,540.95	.....
Grant	1,269,344.18	688,277.99	188,600.65	392,465.54	.....
Harney	578,494.66	282,587.21	114,941.16	180,966.29	.....
Hood River	2,472,771.17	2,130,065.08	283,001.46	59,704.63	.....
Jackson	3,691,336.42	2,829,075.15	533,952.88	284,886.21	43,422.18
Jefferson	595,789.13	296,444.36	142,282.18	156,322.59	740.00
Josephine	2,709,057.94	2,399,466.61	90,077.78	219,513.55	.....
Klamath	2,761,001.84	1,147,773.63	773,022.96	832,023.21	8,182.04
Lake	999,561.62	591,921.36	229,498.25	178,142.01	.....
Lane	3,721,252.33	2,575,078.01	873,494.26	221,030.94	51,649.12
Lincoln	2,388,483.04	1,769,951.05	206,973.57	410,811.45	746.97
Linn	1,576,582.88	967,494.12	400,551.54	162,086.66	46,450.56
Malheur	1,498,383.40	850,084.91	270,722.44	347,576.05	30,000.00
Marion	1,385,668.30	820,252.03	284,258.78	281,157.49	.....
Morrow	1,219,007.85	900,184.27	318,823.58	.....	.....
Multnomah	78,861.10	11,515.98	67,345.12	.....	.....
Polk	1,912,810.51	1,424,978.69	145,669.51	342,162.31	.....
Sherman	1,079,258.72	505,797.03	274,322.61	297,391.29	1,747.79
Tillamook	2,232,601.71	1,655,272.44	338,367.10	238,962.17	.....
Umatilla	3,171,167.29	2,083,411.62	733,390.02	341,983.67	12,381.98
Union	2,306,537.81	1,453,732.88	653,772.11	103,032.76	96,000.06
Wallowa	987,228.83	486,586.27	364,540.13	136,102.43	.....
Wasco	4,002,243.87	2,014,670.29	856,939.44	1,120,404.48	10,229.66
Washington	1,599,709.13	1,302,587.76	116,612.50	172,428.55	8,080.32
Wheeler	1,344,951.69	766,713.22	184,078.49	394,159.98	.....
Yamhill	2,615,295.81	1,714,077.06	466,321.33	424,288.34	10,609.08
Miscellaneous	7,281.00	7,281.00	.....	.....	.....
Totals	$ 78,923,740.18	$ 53,010,757.39	$ 13,763,108.15	$ 11,603,488.79	$ 546,385.85
Expenditures for Maintenance Work	14,890,520.24	14,716,574.35	105,163.73	66,887.60	1,894.56
Expenditures for General Purposes	25,719,348.81	25,709,439.06	9,909.75	.....	.....
Grand totals..	$119,533,609.23	$ 93,436,770.80	$ 13,878,181.63	$ 11,670,376.39	$ 548,280.41

* Includes $170,000 paid by Multnomah County on the Mt. Hood Highway.

TABLE No. 7

EXPENDITURES FOR CONSTRUCTION WORK CLASSIFIED BY HIGHWAYS, Years 1917 to 1928, Inclusive

This table gives the totals of the expenditures made for construction work upon each of the several state highways during the 12-year period ending November 30, 1928. It includes expenditures for new construction, additions and betterments, surveys and the engineering of county construction. It includes also state expenditures in connection with forest highway work. It does not include expenditures for maintenance work or the expenditures of the federal government and counties in connection with forest highway construction work.

Hwy. No.	Highway	Total Amount Expended	Cooperation in Expenditures			
			By State	By County	By Federal Government	By Miscellaneous Contributors
1	Pacific	$ 14,931,194.20	$12,526,959.84	$ 1,098,418.17	$ 1,072,117.96	$233,698.23
2	Columbia River	10,207,660.35	8,459,835.04	388,934.62	1,348,661.03	10,229.66
3	West Side Pacific	4,100,559.12	2,867,725.11	397,512.51	816,632.10	18,689.40
4	The Dalles-California	4,011,763.66	1,489,771.04	1,195,307.87	1,325,944.75	740.00
5	John Day	3,885,731.38	1,906,222.73	660,545.24	1,318,963.41	
6	Old Oregon Trail	4,004,972.52	2,557,014.80	718,039.65	566,307.58	163,610.49
7	Central Oregon	371,225.19	269,496.99	76,767.33	24,960.87	
8	Oregon-Washington	2,354,175.79	1,892,962.98	461,212.81		
9	Roosevelt Coast	10,731,763.77	6,948,538.79	1,474,666.30	2,307,811.71	746.97
10	La Grande-Wallowa Lake	1,540,841.14	766,701.39	544,924.56	224,135.19	5,080.00
11	Enterprise-Flora	237,715.25	166,093.76	71,621.49		
12	Baker-Cornucopia	881,163.62	256,948.38	495,476.18	128,739.06	
13	Baker-Unity	700,538.82	371,850.42	328,688.40		
14	Prineville-Central Oregon	389,610.44	291,109.46	98,500.98		
15	McKenzie	915,993.81	634,626.04	171,878.75	109,489.02	
16	Santiam	276,877.03	139,249.11	113,049.37		24,578.55
17	McKenzie-Bend	57,690.98	57,690.98			
18	Willamette	306,599.00	37,890.90	268,708.10		
19	Fremont	648,084.14	286,917.88	183,024.25	178,142.01	
20	Klamath Falls-Lakeview	1,029,882.60	695,055.30	253,200.41	80,304.48	1,322.41
21	Ashland-Klamath Falls	1,207,097.31	334,124.92	550,159.73	315,953.03	6,859.63
22	Crater Lake	1,264,344.34	867,001.37	188,000.00	209,342.97	
23	Dairy-Bonanza	78,379.69	43,515.89	34,863.80		
24	Burns-Crane	368,174.24	164,012.03	48,156.79	156,005.42	
25	Redwood	863,022.01	589,000.64	54,507.82	219,513.55	
26	Mt. Hood	1,694,149.73	1,186,412.65	507,737.08		
27	Alsea	1,056,361.92	783,592.97	272,768.95		
28	Pendleton-John Day	181,140.68	49,665.23	131,475.45		
29	Tualatin Valley	1,469,064.04	1,119,650.09	195,893.95	153,520.00	
30	Salem-Dallas	730,757.83	362,680.84	295,472.12	72,604.87	
31	Albany-Corvallis	567,106.47	100,328.04	165,101.15	299,593.00	2,084.28
32	McMinnville-Tillamook	1,099,839.05	1,005,351.09	75,020.38	19,467.58	
33	Corvallis-Newport	1,040,427.59	765,677.98	266,129.35		8,620.26
34	Siuslaw	647,322.04	415,346.55	231,975.49		
35	Coos Bay-Roseburg	1,796,824.74	888,211.33	651,940.43	243,072.98	13,600.00
36	Pendleton-Cold Springs	215,803.04	24,563.60	191,239.44		
37	Umatilla Cut off	308.22	308.22			
38	Oregon Caves	256,464.90	242,464.90	14,000.00		
40	Bertha-Beaverton	128,862.86	123,862.86	5,000.00		
41	Ochoco	916,601.20	621,664.92	168,593.13	126,343.15	
42	Sherman	783,240.85	158,119.03	360,879.73	262,494.30	1,747.79
43	Monmouth-Independence	64,023.89	64,023.89			
44	Wapinitia	199,844.47	199,844.47			
	Undistributed expense	710,536.26	278,672.94	353,716.37	23,368.77	54,778.18
	Totals	$ 78,923,740.18	$53,010,757.39	$13,763,108.15	$11,603,488.79	$546,385.85
	Expenditures for maintenance	14,890,520.24	14,716,574.35	105,163.73	66,887.60	1,894.56
	Expenditures for general purposes	25,719,348.81	25,709,439.06	9,909.75		
	Grand totals	$119,533,609.23	$93,436,770.80	$13,878,181.63	$11,670,376.39	$548,280.41

TABLE No. 8

EXPENDITURES FOR MAINTENANCE WORK CLASSIFIED BY COUNTIES

Years 1917 to 1928, Inclusive

This table gives the totals of expenditures made for maintenance work in each of the several counties during the 12-year period ending November 30, 1928. It includes all expenditures for special maintenance, general maintenance and operation of draw bridges.

County	Total Amount Expended	Cooperation in Expenditures			
		By State	By County	By Federal Government	By Miscellaneous Contributors
Baker	$ 699,469.56	$ 698,679.78	$ 789.78	$	$
Benton	371,044.55	370,728.74	315.81		
Clackamas	452,245.76	452,004.79	240.97		
Clatsop	437,504.10	414,908.19	21,701.35		894.56
Columbia	299,335.12	299,335.12			
Coos	707,473.89	675,462.98	10,622.89	21,388.02	
Crook	136,323.56	136,323.56			
Curry	234,610.29	230,232.43	205.18	4,172.68	
Deschutes	361,797.56	361,557.46	240.10		
Douglas	739,716.92	734,933.70	4,783.22		
Gilliam	518,806.72	516,507.58	2,299.14		
Grant	177,650.18	175,220.01	2,430.17		
Harney	42,274.79	42,162.87	111.92		
Hood River	459,739.13	459,739.13			
Jackson	661,068.82	656,246.35	4,822.47		
Jefferson	184,470.71	184,470.71			
Josephine	259,695.59	258,054.00	1,641.59		
Klamath	943,065.21	941,849.14	48.52	1,167.55	
Lake	104,973.78	104,973.78			
Lane	438,072.64	436,065.58	2,007.06		
Lincoln	337,261.24	336,940.74	320.50		
Linn	181,266.44	178,385.98	2,880.46		
Malheur	379,661.31	379,201.55	459.76		
Marion	231,616.66	231,406.25	210.41		
Morrow	501,318.23	498,341.50	2,976.73		
Multnomah	8,718.04	8,718.04			
Polk	253,678.40	253,079.33	599.07		
Sherman	290,258.62	290,258.62			
Tillamook	589,498.66	579,719.07	8,779.59		1,000.00
Umatilla	1,287,074.58	1,239,215.70	7,699.53	40,159.35	
Union	698,380.27	697,865.58	514.69		
Wallowa	262,880.71	262,880.71			
Wasco	488,215.44	487,438.83	776.61		
Washington	195,827.62	184,286.87	11,540.75		
Wheeler	172,526.91	170,833.19	1,693.72		
Yamhill	501,382.16	486,930.42	14,451.74		
Undistributed expense	281,616.07	281,616.07			
Totals	$14,890,520.24	$14,716,574.35	$105,163.73	$ 66,887.60	$ 1,894.56

TABLE No. 9

EXPENDITURES FOR MAINTENANCE WORK CLASSIFIED BY HIGHWAYS

Years 1917 to 1928, Inclusive

This table gives the totals of expenditures made for maintenance work upon each of the several state highways during the 12-year period ending November 30, 1928. It includes all expenditures for special maintenance, general maintenance and operation of draw bridges.

Hwy. No.	Highway	Total Amount Expended	Cooperation in Expenditures			
			By State	By County	By Federal Government	By Miscellaneous Contributors
1	Pacific	$ 1,554,055.68	$ 1,538,269.50	$ 15,786.18	$	$
2	Columbia River	2,224,627.13	2,208,991.33	14,741.24		894.56
3	West Side Pacific	272,185.41	265,987.48	6,197.93		
4	The Dalles-California	1,276,320.46	1,275,447.06	48.52	824.88	
5	John Day	662,137.47	657,079.48	5,057.99		
6	Old Oregon Trail	1,650,454.20	1,609,221.52	1,073.33	40,159.35	
7	Central Oregon	39,413.47	39,398.02	15.45		
8	Oregon-Washington	515,946.06	510,594.60	5,351.46		
9	Roosevelt Coast	1,323,808.10	1,275,946.22	21,301.18	25,560.70	1,000.00
10	LaGrande-Wallowa Lake	496,309.40	496,309.40			
11	Enterprise-Flora	27,672.07	27,672.07			
12	Baker-Cornucopia	114,734.96	113,945.18	789.78		
13	Baker-Unity	46,957.80	46,957.80			
14	Prineville-Central Oregon	24,116.24	24,116.24			
15	McKenzie	193,960.54	193,960.54			
16	Santiam	43,983.31	43,983.31			
17	McKenzie-Bend	45,996.06	45,996.06			
18	Willamette	19,748.25	19,748.25			
19	Fremont	92,777.37	92,777.37			
20	Klamath Falls-Lakeview	110,307.83	110,307.83			
21	Ashland-Klamath Falls	316,826.71	316,826.71			
22	Crater Lake	253,991.56	253,648.89		342.67	
23	Dairy-Bonanza	8,530.19	8,530.19			
24	Burns-Crane	26,169.00	26,072.53	96.47		
25	Redwood	114,300.22	114,300.22			
26	Mt. Hood	509,498.58	509,498.58			
27	Alsea	118,182.76	118,182.76			
28	Pendleton-John Day	4,884.63	4,884.63			
29	Tualatin-Valley	164,787.91	154,794.70	9,993.21		
30	Salem-Dallas	72,541.57	72,488.62	52.95		
31	Albany-Corvallis	19,002.81	18,202.81	800.00		
32	McMinnville-Tillamook	759,173.28	741,934.91	17,238.37		
33	Corvallis-Newport	388,195.79	387,875.29	320.50		
34	Siuslaw	105,997.93	105,997.93			
35	Coos Bay-Roseburg	566,136.94	562,298.77	3,838.17		
36	Pendleton-Cold Springs	16,114.15	16,114.15			
37	Umatilla Cut-off					
38	Oregon Caves	21,512.92	21,512.92			
40	Bertha-Beaverton	14,695.07	12,955.12	1,739.95		
41	Ochoco	175,390.98	175,390.98			
42	Sherman	195,945.75	195,945.75			
43	Monmouth-Independence	7,239.85	7,239.85			
44	Wapinitia	967.70	967.70			
	Undistributed expense	294,922.13	294 201.08	721.05		
	Totals	$14,890,520.24	$14,716,574.35	$105,163.73	$66,887.60	$ 1,894.56

TABLE No. 10

FOREST HIGHWAY EXPENDITURES ON STATE HIGHWAY ROUTES CLASSIFIED BY COUNTIES

Years 1917 to 1928, Inclusive

In this table are given the expenditures that have been made in connection with forest highway construction work on the state highway system. This work was supervised by the United States Bureau of Public Roads, and the amounts of Federal Government expenditure and county expenditure here shown are as reported by that bureau. The state expenditures shown are included also in the foregoing table No. 6, but the Federal Government and county expenditures are not included in that table. For a classification of these expenditures by highways, see table No. 11.

County	Total Amount Expended	Cooperation in Expenditures		
		By State	By County	By Federal Government
Baker	$ 187,624.13	$ 93,520.06	$ 584.00	$ 93,520.07
Clackamas	710,687.57	296,111.76	.....	414,575.81
Coos	231,790.61	.....	83,000.00	148,790.61
Crook	111,143.34	39,634.17	26,875.00	44,634.17
Curry	356,491.75	116,289.11	30,000.00	210,202.64
Deschutes	223,093.13	106,546.57	5,000.00	111,546.56
Douglas	409,776.86	216,110.19	56,333.33	137,333.34
Grant	577,863.92	75,965.28	218,026.76	283,871.88
Hood River	504,948.75	252,643.93	.....	252,304.82
Jackson	599,278.89	271,095.20	3,438.81	324,744.88
Josephine	453,855.11	257,433.59	14,522.99	181,898.53
Klamath	756,382.56	212,957.66	172,454.97	370,969.93
Lake	250,566.84	127,448.44	.....	123,118.40
Lane	1,321,426.83	471,762.67	185,000.00	664,664.16
Lincoln	1,227,237.29	504,103.62	285,000.00	438,133.67
Linn	250,977.93	.....	116,500.00	134,477.93
Tillamook	442,057.05	272,187.67	18,624.69	151,244.69
Umatilla	76,336.20	.....	3,000.00	73,336.20
Wallowa	240,204.66	67,951.65	39,210.35	133,042.66
Wasco	305,981.68	150,777.16	25,000.00	130,204.52
Wheeler	219,010.12	105,060.12	4,900.00	109,050.00
Totals	$9,456,735.22	$3,637,598.85	$1,287,470.90	$4,531,665.47

TABLE No. 11

FOREST HIGHWAY EXPENDITURES ON STATE HIGHWAY ROUTES CLASSIFIED BY HIGHWAYS

Years 1917 to 1928, Inclusive

In this table are given the expenditures that have been made in connection with forest highway construction work on the state highway system. This work was supervised by the United States Bureau of Public Roads, and the amounts of federal government expenditure and county expenditure here shown are as reported by that bureau. The state expenditures shown are included also in the foregoing table No. 7, but the Federal Government and county expenditures are not included in that table. For a classification of these expenditures by counties, see table No. 10.

Hwy. No.	Highway	Total Amount Expended	Cooperation in Expenditures		
			By State	By County	By Federal Government
1	Pacific	$ 309,776.86	$ 182,776.86	$ 23,000.00	$ 104,000.00
4	The Dalles-California	636,486.69	178,806.28	149,592.81	308,087.60
5	John Day	621,192.20	149,485.34	162,110.76	309,596.10
9	Roosevelt Coast	1,373,413.55	451,789.11	233,000.00	688,624.44
11	Enterprise-Flora	240,204.66	67,951.65	39,210.35	133,042.66
15	McKenzie	898,606.12	429,278.06	20,000.00	449,328.06
16	Santiam	250,977.93		116,500.00	134,477.93
18	Willamette	56,701.53	13,500.00	10,000.00	33,201.53
19	Fremont	30,362.79	879.37		29,483.42
20	Klamath Falls-Lakeview	249,508.96	126,919.50		122,589.46
22	Crater Lake	682,072.50	301,060.92	26,300.97	354,710.61
25	Redwood	194,160.63	130,121.32	9,522.99	54,516.32
26	Mt. Hood	1,114,326.44	499,688.38		614,638.06
27	Alsea	674,262.78	291,262.78	165,000.00	218,000.00
28	Pendleton-John Day	220,632.05	20,000.00	59,500.00	141,132.05
32	McMinnville-Tillamook	209,900.37	149,528.51	18,624.69	41,747.17
34	Siuslaw	597,009.66	139,366.41	160,000.00	297,643.25
38	Oregon Caves	259,694.48	127,312.27	5,000.00	127,382.21
41	Ochoco	330,153.46	144,694.29	31,775.00	153,684.17
44	Wapinitia	407,291.56	199,844.47	25,000.00	182,447.09
	Miscellaneous	100,000.00	33,333.33	33,333.33	33,333.34
	Totals	$9,456,735.22	$3,637,598.85	$1,287,470.90	$4,531,665.47

TABLE No. 12

STATISTICS PERTAINING TO FOREST HIGHWAY WORK ON STATE HIGHWAYS

The statistics here given apply to highway work in the State of Oregon performed under the supervision of the United States Bureau. of Public Roads. All of the work included is upon state highways at points where these highways are in or adjacent to National Forests. The work is financed under cooperative agreements between the Federal Government, the State and the counties of the State, the Federal funds being Oregon's proportionate share of funds annually appropriated by Congress for forest road work.

The amounts of county and Federal Government expenditures here given, and the mileages of work performed, are as reported by the United States Bureau of Public Roads. The amounts of State expenditures are as shown by the disbursement records of the State Highway Commission.

For further details as to expenditures made in connection with forest road work, see Table XII in Part Three of this report.

EXPENDITURES ON FOREST HIGHWAY WORK

Year	Expenditures			
	State Funds	County Funds	Government Funds	Total
1918-1919-1920	$ 809,261.58	$ 102,271.45	$ 656,708.64	$1,568,241.67
1921-1922	724,970.53	67,142.21	836,765.18	1,628,877.92
1923-1924	1,092,660.31	725,942.05	1,725,176.76	3,543,779.12
1925	587,401.88	119,497.58	224,337.35	931,236.81
1926	172,360.70	112,462.46	505,888.42	790,711.58
1927	147,859.76	105,611.36	325,542.44	579,013.56
1928	103,084.09	54,543.79	257,246.68	414,874.56
Totals	$3,637,598.85	$1,287,470.90	$4,531,665.47	$9,456,735.22

MILEAGES OF WORK COMPLETED ON FOREST HIGHWAY PROJECTS

Year	Grading (Miles)	Grade Widening	Rock Surfacing (Miles)	Surveys (Miles)
1918	4.30	.....	.....	121.92
1919	62.90	.....	.....	90.92
1920	56.10	.....	22.59	41.38
1921	20.68	.....	38.34	41.31
1922	15.69	.....	22.37	137.18
1923	61.00	.....	87.92	46.82
1924	153.37	.....	74.62	48.28
1925	34.70	.....	83.94	44.40
1926	52.32	.....	41.41	5.40
1927	25.10	14.70	53.50	11.30
1928	16.80	7.00	17.60	59.90
Totals	502.96	21.70	442.29	648.81

TABLE No. 13

MILEAGES OF FOREST HIGHWAY WORK PERFORMED ON STATE HIGHWAYS DURING 1927 AND 1928

This table shows the mileages, by sections, of the different classes of work performed on the state highway system under the supervision of the United States Bureau of Public Roads during the period December 1, 1926, to November 30, 1928. The work is commonly referred to as forest highway work. It is located within or adjacent to the National Forests, and it is financed by the Federal Government assisted by cooperation from the State and from counties.

County and Section	Mileages			
	Grading	Grade Widening	Surfacing	Surveys
CLACKAMAS COUNTY				
Forest Boundary-Hood River County Line	.....	10.0	.....	.....
CURRY COUNTY				
Euchre Creek-Rogue River Section	.....	.....	11.0	.....
GRANT COUNTY				
Long Creek-South Forest Boundary Section	6.0	.....	14.0	.....
Beach Creek Section	4.1	.....	4.1	5.9
JOSEPHINE COUNTY				
Oregon Caves Highway	.....	11.7	.....	6.0
KLAMATH AND LAKE COUNTIES				
Lapine-Silver Lake Section	5.8	.....	.....	.....
Drews Valley-West Forest Boundary Section	4.7	.....	11.7	.....
KLAMATH AND LANE COUNTIES				
Crescent-Lowell Section	.....	.....	.....	3.5
LANE COUNTY				
Rainrock-Florence Section	.....	.....	.....	20.3
Goodman Creek Section	1.6	.....	.....	.....
LINCOLN COUNTY				
Scott Creek Section	.....	.....	2.2	.....
Yaquina Bay-Beaver Creek	2.8	.....	.....	.....
LINN AND JEFFERSON COUNTIES				
Cascadia-Sisters Section	.....	.....	.....	34.5
LINN COUNTY				
Sheas Hill-Cascadia Section	1.3	.....	6.6	1.0
Cascadia-Ranger Station Section	2.7	.....	.....	.....
WALLOWA COUNTY				
Flora-North Forest Boundary section	.....	.....	9.7	.....
WASCO COUNTY				
Clear Lake-Wapinitia Section	12.9	.....	11.8	.....
Totals	41.9	21.7	71.1	71.2

TABLE No. 14

COUNTY BONDS FOR ROAD PURPOSES, 1913-1928

This tabulation was compiled from reports from the various county treasurers as of November 6, 1928

County	Date Voted	Amount	Amount Sold	Bonds Matured and Paid	Sinking Fund on Hand	Less Matured Bonds and Sinking Fund
Baker	June 3, 1919	$ 500,000.00	$ 500,000.00	$	$ 66,907.83	$ 433,092.17
Baker	November 4, 1924	500,000.00	500,000.00	.....	.....	500,000.00
Benton	June 3, 1919	220,000.00	220,000.00	187,000.00	33,000.00	.....
Benton*	October —, 1923	40,000.00	40,000.00	.....	40,000.00	.....
Benton	March 29, 1926	200,000.00	200,000.00	22,000.00	35,000.00	143,000.00
Clackamas	November 24, 1919	1,700,000.00	1,700,000.00	135,000.00	60,000.00	1,505,000.00
Clatsop	November 4, 1913	400,000.00	400,000.00	.....	224,680.02	175,319.98
Clatsop	November 2, 1920	100,000.00	100,000.00	.....	82,654.07	17,345.93
Columbia	February —, 1914	360,000.00	360,000.00	190,000.00	106,987.82	63,012.18
Coos	June —, 1916	362,000.00	362,000.00	289,600.00	.....	72,400.00
Coos	June 7, 1921	300,000.00	300,000.00	275,000.00	.....	25,000.00
Coos	March 29, 1926	980,000.00	680,000.00	.....	.....	680,000.00
Crook	May 17, 1918	95,000.00	95,000.00	.....	.....	95,000.00
Crook	November 7, 1919	220,000.00	220,000.00	33,000.00	.....	187,000.00
Curry	May 3, 1919	98,000.00	98,000.00	.....	35,400.00	62,600.00
Curry	June 17, 1921	165,000.00	165,000.00	22,600.00	10,100.00	132,300.00
Deschutes	June 3, 1919	125,000.00	125,000.00	108,000.00	.....	17,000.00
Deschutes	November 1, 1923	50,000.00	50,000.00	.....	.....	50,000.00
Deschutes	June 7, 1921	50,000.00	50,000.00	.....	.....	50,000.00
Deschutes	March 1, 1924	65,000.00	65,000.00	.....	.....	65,000.00
Deschutes	May 20, 1926	185,000.00	185,000.00	21,000.00	.....	164,000.00
Douglas	October 1, 1917	555,500.00	555,500.00	309,000.00	146,000.00	100,500.00
Douglas	June 7, 1921	1,100,000.00	1,100,000.00	360,000.00	740,000.00	.....
Gilliam	June 3, 1919	250,000.00	250,000.00	.....	5,836.64	244,163.36
Gilliam	May 16, 1924	75,000.00	75,000.00	.....	5,836.64	69,163.36
Grant	June 4, 1917	140,000.00	125,000.00	125,000.00	.....	.....
Grant	June 7, 1921	440,000.00	425,000.00	10,000.00	.....	415,000.00
Harney	November 28, 1925	200,000.00	200,000.00	.....	.....	200,000.00
Hood River	June 15, 1914	75,000.00	75,000.00	54,000.00	.....	21,000.00
Hood River	June 7, 1921	350,000.00	350,000.00	.....	25,710.58	324,289.42
Jackson	September 9, 1913	500,000.00	500,000.00	283,000.00	127,856.52	89,143.48
Jackson	May 21, 1920	500,000.00	500,000.00	256,000.00	79,152.21	164,847.79
Jefferson	June 3, 1919	100,000.00	100,000.00	20,000.00	.....	80,000.00
Josephine**	.....	.....	.....	.....	.....	.....
Klamath	June 3, 1919	347,704.00	347,704.00	.....	21,037.93	326,666.07

Klamath	February	21, 1922	800,000.00	800,000.00	----------	21,037.94	778,962.06
Klamath	November	4, 1924	125,000.00	125,000.00	----------	21,037.94	103,962.06
Klamath	June	28, 1927	500,000.00	500,000.00	----------	21,037.94	478,962.06
Lake	June	3, 1919	200,000.00	200,000.00	54,000.00	818.71	145,181.29
Lane	November	----, 1920	2,000,000.00	1,743,500.00	295,300.00	44,726.89	1,403,473.11
Lincoln	June	3, 1919	180,000.00	180,000.00	90,000.00	----------	90,000.00
Lincoln	June	7, 1921	343,240.00	343,240.00	102,972.00	----------	240,268.00
Lincoln	May	19, 1922	103,000.00	103,000.00	58,000.00	----------	45,000.00
Linn	June	3, 1919	600,000.00	600,000.00	535,200.00	----------	64,800.00
Linn	November	6, 1923	180,000.00	180,000.00	140,700.00	----------	39,300.00
Malheur	June	3, 1919	260,000.00	260,000.00	35,000.00	38,121.54	186,878.46
Marion	June	3, 1919	850,000.00	850,000.00	340,000.00	----------	510,000.00
Morrow	June	3, 1919	290,000.00	290,000.00	98,000.00	117,777.00	74,223.00
Morrow	March	29, 1626	550,000.00	440,000.00	----------	----------	440,000.00
Multnomah	April	14, 1915	1,250,000.00	1,250,000.00	1,125,000.00	----------	125,000.00
Multnomah (Interstate Bridge)	November	4, 1913	1,250,000.00	1,250,000.00	550,000.00	634,000.00	66,000.00
Multnomah (Burnside Bridge)	November	7, 1922	3,000,000.00	3,000,000.00	----------	----------	3,000,000.00
Multnomah (Ross Island Bridge)	November	7, 1922	1,600,000.00	1,600,000.00	----------	----------	1,600,000.00
Multnomah (Sellwood Bridge)	November	7, 1922	350,000.00	350,000.00	----------	----------	350,000.00
Multnomah (Ross Island & Sellwood Bridges)	November	4, 1924	500,000.00	500,000.00	----------	----------	500,000.00
Multnomah	May	21, 1926	2,500,000.00	2,200,000.00	----------	----------	2,200,000.00
Multnomah (Broadway Bridge)	November	2, 1926	750,000.00	750,000.00	----------	----------	750,000.00
Multnomah (St. Johns Bridge)	May	18, 1928	4,250,000.00	----------	----------	----------	----------
Polk	June	3, 1919	265,000.00	----------	----------	----------	----------
Sherman	April	5, 1919	300,000.00	300,000.00	----------	27,833.00	272,167.00
Tillamook	June	3, 1919	430,000.00	430,000.00	122,600.00	23,335.38	284,064.62
Umatilla	March	4, 1919	1,050,000.00	1,050,000.00	945,000.00	----------	105,000.00
Union	October	11, 1919	1,498,000.00	1,100,000.00	270,000.00	45,937.82	784,062.18
Wallowa	June	3, 1919	300,000.00	300,000.00	100,000.00	----------	200,000.00
Wasco	November	7, 1916	260,000.00	260,000.00	182,000.00	----------	78,000.00
Wasco	November	2, 1920	100,000.00	----------	----------	----------	----------
Wasco	June	7, 1921	800,000.00	750,000.00	30,000.00	20,400.00	699,600.00
Washington	----------	----------	----------	----------	----------	----------	----------
Wheeler	November	7, 1916	80,000.00	80,000.00	23,000.00	----------	57,000.00
Wheeler	June	3, 1919	44,000.00	44,000.00	----------	6,639.40	37,360.60
Wheeler	June	7, 1921	140,000.00	140,000.00	----------	----------	140,000.00
Yamhill	June	3, 1919	360,000.00	360,000.00	130,000.00	----------	230,000.00
Yamhill	May	21, 1920	396,000.00	396,000.00	46,000.00	----------	350,000.00
Grand totals	----------	----------	$ 39,802,444.00	$ 33,742,944.00	$ 7,972,972.00	$ 2,868,863.82	$ 22,901,108.18

*Of a total bond issue of $96,000 voted in Benton county in October, 1923, approximately $40,000 was for road building purposes.
**Josephine county has no bond indebtedness for road building purposes, but it has an indebtedness for that purpose of $11,755.22 in time warrants.

TABLE No. 15

COUNTY DISBURSEMENTS FOR ROAD PURPOSES—1921 TO 1928, INCLUSIVE

This tabulation was compiled from information supplied by the officials of the respective counties, supplemented in a few instances by information from other sources. The amounts given are not represented to be more than approximate figures, although for many counties they are probably exact. For expenditures during years prior to 1921, see earlier reports of the State Highway Commission.

County	1921	1922	1923	1924	1925	1926	1927	1928 (Estimated)
Baker	$ 111,363.44	$ 303,819.25	$ 227,449.02	$ 245,207.31	$ 412,558.41	$ 232,316.27	$ 193,197.97	$ 117,920.00
Benton	148,585.25	39,860.03	130,096.14	162,763.08	183,790.82	234,907.43	188,507.94	114,400.00
Clackamas	796,167.62	915,000.00	741,396.00	797,591.16	861,189.80	1,123,964.47	598,680.10	554,080.30
Clatsop	548,140.00	310,292.76	331,068.20	447,471.68	426,013.44	402,551.36	392,296.48	353,860.29
Columbia	385,588.28	192,605.92	256,638.16	300,471.74	409,842.20	238,698.18	366,756.70	386,633.17
Coos	722,002.44	427,467.67	511,752.46	422,413.94	786,378.64	597,696.45	573,917.92	526,557.31
Crook	129,400.01	* 100,000.00	89,600.00	50,000.00	49,011.22	36,015.38	29,027.74	32,957.08
Curry	87,350.00	32,973.42	45,953.57	77,415.56	94,672.02	32,496.88	36,518.08	25,745.03
Deschutes	* 30,000.00	97,392.22	28,562.22	73,669.19	109,680.81	52,408.87	74,351.05	50,877.83
Douglas	532,160.28	980,000.00	505,855.44	412,598.32	363,657.27	328,825.60	414,885.83	350,000.00
Gilliam	80,933.28	164,422.64	187,307.98	122,599.13	69,741.92	41,378.73	43,778.40	61,197.52
Grant	26,000.00	62,831.99	70,268.64	55,444.42	38,355.75	87,953.27	71,323.04	58,120.18
Harney	90,994.12	54,850.77	49,314.73	40,077.47	65,254.48	94,624.30	91,892.64	87,457.00
Hood River	* 70,000.00	85,025.15	78,048.05	92,403.85	110,384.49	82,965.50	95,462.00	88,558.00
Jackson	467,115.32	549,466.96	304,190.68	465,045.45	307,345.45	165,625.81	288,222.65	235,000.00
Jefferson	* 30,000.00	31,581.50	39,541.80	40,845.61	31,072.01	36,581.58	37,390.29	58,420.28
Josephine	104,582.15	54,872.93	75,244.07	67,245.38	86,245.55	92,079.38	186,391.33	150,008.60
Klamath	832,661.37	313,539.82	655,182.52	329,727.42	263,921.42	255,152.84	171,015.44	400,000.00
Lake	77,317.00	100,000.00	93,207.00	123,240.31	101,862.22	81,255.36	101,053.41	74,926.81
Lane	453,753.99	734,517.49	782,177.50	600,408.68	562,286.34	515,702.23	635,985.08	700,000.00
Lincoln	131,641.39	215,523.59	300,424.12	270,371.88	207,988.77	190,391.32	182,195.43	186,500.00
Linn	589,882.39	388,011.77	332,643.22	413,213.62	575,933.98	426,230.83	386,270.10	400,000.00
Malheur	156,613.85	117,889.77	65,996.02	135,027.23	139,169.60	99,110.54	70,540.67	63,041.92
Marion	647,102.38	604,642.79	715,091.40	588,836.39	537,791.70	521,936.49	629,064.71	570,000.00
Morrow	201,641.94	120,177.59	120,370.11	140,724.49	82,511.74	209,222.45	98,730.48	165,634.20
Multnomah	478,993.82	302,197.66	537,624.20	1,750,358.88	3,668,661.20	3,651,949.64	3,708,517.44	1,871,658.62
Polk	185,460.24	74,407.05	147,017.58	194,740.91	155,340.35	184,458.06	144,892.19	190,000.00
Sherman	93,769.83	98,096.12	118,211.15	153,895.91	87,584.17	90,122.96	108,717.83	110,000.00
Tillamook	222,591.00	430,168.01	284,766.76	229,151.72	221,273.67	223,761.94	237,990.76	250,098.14
Umatilla	378,647.42	350,271.58	321,290.36	283,500.30	397,383.53	234,120.33	223,379.30	347,665.65
Union	344,620.51	667,185.50	318,670.87	327,002.91	106,450.86	130,564.64	147,606.98	156,775.00
Wallowa	166,348.74	205,135.77	143,105.02	151,642.77	105,992.45	124,003.36	140,324.92	115,463.32
Wasco	238,001.68	305,638.63	353,381.16	662,715.66	375,488.42	291,589.49	261,052.27	243,800.00
Washington	282,899.11	290,991.10	311,269.30	505,529.31	520,088.81	365,909.23	396,712.35	382,461.10
Wheeler	81,209.98	157,000.00	70,296.00	42,221.07	63,827.16	38,420.78	45,727.01	67,007.55
Yamhill	* 300,000.00	298,851.28	218,644.30	217,542.82	231,008.98	243,453.88	250,901.16	243,101.55
	$10,223,538.83	$10,176,708.73	$ 9,561,655.75	$10,993,115.57	$12,809,759.65	$11,767,545.83	$11,623,277.69	$ 9,789,926.45

* Amounts approximated; figures not furnished by county officials.

TABLE No. 16

STATISTICS PERTAINING TO MOTOR VEHICLE REGISTRATIONS AND TO REVENUES FROM MOTOR VEHICLE LICENSE FEES AND FROM THE TAX ON GASOLINE

In arriving at the number of persons per registered vehicle, it has been assumed that the population of the state has increased at a uniform annual rate equal to one-tenth of the total increase in population between 1910 and 1920.

Year	Number of Motorcycles	Number of Motor Vehicles Other Than Motorcycles							Number of Persons Per Motor Vehicle	License Fee Revenues		Gasoline Tax Revenues	
		Passenger Cars	Ambulances and Hearses	Busses and Stages	Delivery Cars Less Than 1 ton Capacity	Trucks	Trailers	Total of Motor Vehicles Except Motorcycles		Total Gross Revenue	Average per Motor Vehicle	Total Gross Revenue	Average per Motor Vehicle
1913 *	2,100	.....	.....	.....	.....	.....	.....	11,857	59.54	$ 56,873.00	$ 4.80	$	$ .....
1914	2,898	.....	.....	.....	.....	.....	.....	16,347	43.86	77,592.00	4.75	.....	.....
1915	3,158	.....	.....	.....	.....	.....	.....	23,585	30.87	108,881.50	4.62	.....	.....
1916	3,368	.....	.....	.....	.....	.....	.....	33,917	21.79	146,232.00	4.31	.....	.....
1917	3,400	.....	.....	.....	.....	.....	.....	48,632	15.43	196,787.50	4.05	.....	.....
1918	3,501	.....	.....	.....	.....	.....	.....	63,324	12.02	461,422.00	7.29	.....	.....
1919	3,570	.....	.....	.....	.....	.....	.....	83,332	9.28	602,239.00	7.23	290,795.49	3.49
1920	3,518	.....	.....	.....	.....	.....	.....	103,790	7.55	2,085,168.50	20.09	443,375.01	4.27
1921	3,164	103,735	127	103	5,223	9,137	290	118,615	6.70	2,334,931.25	19.68	988,247.27	8.33
1922	3,206	118,035	104	592	4,763	10,735	337	134,566	5.99	3,340,519.58	24.82	1,147,556.40	8.53
1923	3,140	146,161	108	840	5,947	12,896	459	166,412	4.91	4,069,609.40	24.46	1,892,013.27	11.37
1924	2,765	169,875	114	906	6,677	14,550	507	192,629	4.30	4,766,453.90	24.74	2,570,653.62	13.34
1925	2,547	191,932	78	953	6,605	16,243	742	216,553	3.87	5,370,201.78	24.79	2,909,095.05	13.43
1926	2,215	207,039	99	973	7,788	17,424	811	234,134	3.62	6,017,759.40	25.70	3,319,111.03	14.18
1927	2,030	218,214	65	925	5,537	19,869	1,095	245,705	3.51	6,527,340.93	26.57	3,643,190.93	14.83
1928	2,012	228,476	64	969	2,954	20,714	1,238	254,415	3.44	†6,969,220.87	†27.39	3,984,308.98	15.66

* Division between motor vehicles and motorcycles is estimated, as separate records are not available.

† This amount includes fees paid by trucks and stages and all other fees related to motor vehicle operation. The regular license fees on the 229,854 privately-owned passenger automobiles amounted in 1928 to $5,619,321.33, or $24.45 per vehicle.

TABLE No. 17

MILEAGES OF STATE HIGHWAYS BY COUNTIES

The mileages given in this table are inclusive of mileages within cities and towns.

County	Total Mileage of State Highways	Miles of Different Types of Improvement						
		Paved With Bituminous Pavement	Paved With Concrete Pavement	Bituminous Macadam Surfacing	Oiled Rock or Gravel Surfacing	Unoiled Rock or Gravel Surfacing	Graded to State Standards	Not Graded to State Standards
Baker	216.8	1.2	.....	.....	67.6	88.4	47.7	11.9
Benton	93.2	24.7	18.3	.....	20.9	29.3	.....	.....
Clackamas	66.8	8.0	11.1	20.0	22.9	4.8	.....	.....
Clatsop	75.5	39.1	12.6	3.0	10.0	10.8	.....	.....
Columbia	55.4	54.5	0.9	.....	.....	.....	.....	.....
Coos	103.7	1.2	21.5	9.0	3.3	67.2	.....	1.5
Crook	82.0	.....	.....	.....	15.9	29.2	28.4	8.5
Curry	91.9	.....	.....	.....	.....	90.6	.....	1.3
Deschutes	202.9	3.5	.....	.....	106.4	19.6	37.7	35.7
Douglas	152.3	80.6	17.8	.....	15.0	26.3	3.0	9.6
Gilliam	98.0	0.1	.....	.....	84.3	13.6	.....	.....
Grant	157.6	.....	.....	.....	.....	115.5	.....	42.1
Harney	125.4	.....	.....	.....	.....	33.3	15.5	76.6
Hood River	69.2	26.7	0.5	1.8	40.2	.....	.....	.....
Jackson	149.8	50.6	9.7	46.3	29.9	13.3	.....	.....
Jefferson	50.5	.....	.....	.....	40.1	.....	.....	10.4
Josephine	96.1	34.6	.....	.....	27.3	26.9	7.3	.....
Klamath	308.8	2.8	.....	4.4	120.7	122.6	13.5	44.8
Lake	188.6	.....	.....	.....	.....	96.9	15.7	76.0
Lane	301.7	34.2	17.8	.....	11.5	91.0	13.6	133.6
Lincoln	132.8	.....	.....	.....	27.9	74.5	2.8	27.6
Linn	119.7	27.3	9.7	.....	13.2	13.7	17.0	38.8
Malheur	190.7	1.8	1.0	.....	58.3	63.0	.....	66.6
Marion	43.4	33.5	9.9	.....	.....	.....	.....	.....
Morrow	94.3	.....	.....	.....	67.0	27.3	.....	.....
Multnomah	111.3	104.4	5.2	.....	.....	1.7	.....	.....
Polk	49.8	27.5	14.7	5.5	0.8	1.3	.....	.....
Sherman	64.0	.....	.....	.....	58.2	5.8	.....	.....
Tillamook	85.2	10.6	4.2	4.3	36.1	30.0	.....	.....
Umatilla	241.7	41.9	.....	7.0	68.5	77.3	11.7	35.3
Union	85.4	8.8	.....	6.3	52.0	18.3	.....	.....
Wallowa	73.8	0.8	.....	.....	.....	73.0	.....	.....
Wasco	166.1	23.3	.....	.....	87.0	42.1	12.8	0.9
Washington	42.2	26.9	15.3	.....	.....	.....	.....	.....
Wheeler	107.8	.....	.....	.....	0.9	76.4	7.1	23.4
Yamhill	73.9	18.8	37.8	4.4	12.9	.....	.....	.....
Totals	4,368.3	687.4	208.0	112.0	1,098.8	1,383.7	233.8	644.6

TABLE No. 18

MILEAGES OF COUNTY ROADS

The mileages here given include mileages of market roads as well as mileages of other county roads. They do not include mileages of state highways. The mileages of pavement may be considered reasonably accurate, but the mileages of other types of improvement, and the total mileages, are not represented to be more than roughly approximate.

County	Total Mileage of County Roads	Miles of Different Types of Improvement				
		Paved With Bituminous Pavement	Paved With Concrete Pavement	Surfaced With Rock or Gravel	Improved Earth Roads	Unimproved Earth Roads
Baker	4,000	.....	.....	100.0	800	3,100
Benton	411	.....	.....	286.0	32	93
Clackamas	1,470	101.5	82.3	591.2	45	650
Clatsop	225	10.5	29.1	107.4	14	64
Columbia	795	1.6	2.6	292.8	113	385
Coos	620	.....	.....	306.0	122	192
Crook	1,100	.....	.....	60.0	120	920
Curry	125	.....	.....	25.0	3	97
Deschutes	1,755	0.2	.....	2.8	110	1,642
Douglas	1,050	0.4	6.3	788.3	32	223
Gilliam	1,350	.....	.....	26.0	36	1,288
Grant	880	.....	.....	38.0	44	798
Harney	2,400	.....	.....	75.0	250	2,075
Hood River	297	.....	8.5	155.5	67	66
Jackson	1,350	8.4	.....	361.6	380	600
Jefferson	1,900	.....	.....	25.0	20	1,855
Josephine	400	.....	.....	95.0	135	170
Klamath	1,630	.....	.....	140.0	15	1,475
Lake	1,800	.....	.....	37.0	73	1,690
Lane	1,320	.....	.....	417.0	313	590
Lincoln	580	.....	.....	115.0	15	450
Linn	1,200	.....	.....	860.0	.....	340
Malheur	4,200	.....	.....	100.0	600	3,500
Marion	1,280	160.7	.....	716.3	330	73
Morrow	1,180	.....	.....	91.0	33	1,056
Multnomah	* 488	36.0	8.0	315.0	4	125
Polk	1,150	2.5	.....	500.5	443	204
Sherman	600	.....	.....	70.0	200	330
Tillamook	254	.....	2.7	126.3	8	117
Umatilla	3,780	.....	.....	166.0	504	3,110
Union	1,420	.....	.....	202.0	418	800
Wallowa	680	.....	.....	70.0	90	520
Wasco	1,490	5.0	.....	197.0	735	553
Washington	1,180	3.9	.....	653.1	392	131
Wheeler	500	.....	.....	13.0	29	458
Yamhill	1,250	0.5	7.0	505.5	530	207
	46,110	331.2	146.5	8,630.3	7,055	29,947

* In addition to the mileages here shown, Multnomah County has constructed and is maintaining approximately 75 miles of bituminous pavement and 6 miles of concrete pavement which are on state highway routes and which are included in the adjacent table of state highway mileages.

TABLE No. 19

STATE HIGHWAYS
LENGTHS AND MILEAGES OF DIFFERENT TYPES OF IMPROVEMENT

The mileages given in this table are inclusive of mileages within cities and towns.

Highway No.	Highway Name	Total Length in Miles	Miles of Different Types of Improvement						
			Paved With Bituminous Pavement	Paved With Concrete Pavement	Bituminous Macadam Surfacing	Oiled Rock or Gravel Surfacing	Unoiled Rock or Gravel Surfacing	Graded to State Standards	Not Graded to State Standards
1	Pacific	353.7	274.9	76.7	0.6	1.5	.....	.....	.....
2	Columbia River	336.3	188.6	12.4	5.9	129.4	.....	.....	.....
3	West Side Pacific	112.2	64.1	47.7	0.4	.....	.....	.....	.....
4	The Dalles-Calif	317.2	5.5	.....	1.4	280.3	30.0	.....	.....
5	John Day	293.2	0.1	.....	.....	51.1	242.0	.....	.....
6	Old Oregon Trail	208.0	10.4	1.0	2.0	171.4	23.2	.....	.....
7	Central Oregon	258.0	0.3	.....	.....	.....	27.0	43.7	187.0
8	Oregon-Washington	145.3	38.3	.....	.....	61.6	45.4	.....	.....
9	Roosevelt Coast	404.7	30.7	27.3	7.4	46.7	213.7	12.3	66.6
10	La Grande-Wallowa Lake	73.2	3.3	.....	5.4	12.5	52.0	.....	.....
11	Enterprise-Flora	35.0	.....	.....	.....	.....	35.0	.....	.....
12	Baker-Cornucopia	75.6	0.3	.....	.....	.....	36.4	27.0	11.9
13	Baker-Unity	46.1	.....	.....	.....	.....	25.4	20.7	.....
14	Prineville-Bear Ck.	41.0	.....	.....	.....	.....	.....	28.4	12.6
15	McKenzie	112.6	0.5	0.2	.....	30.7	55.3	.....	25.9
16	Santiam	103.5	0.8	.....	.....	13.2	13.7	26.6	49.2
17	McKenzie-Bend	17.4	.....	.....	.....	17.4	.....	.....	.....
18	Willamette	99.0	.....	.....	.....	8.1	.....	7.1	83.8
19	Fremont	158.8	.....	.....	.....	.....	63.0	21.5	74.3
20	Klamath Falls-Lakeview	92.0	.....	.....	.....	.....	75.9	7.6	8.5
21	Ashland-Klamath Falls	57.2	0.6	.....	.....	9.4	47.2	.....	.....
22	Crater Lake	92.8	0.4	.....	48.6	33.6	10.2	.....	.....
23	Dairy-Bonanza	6.7	.....	.....	.....	.....	6.7	.....	.....
24	Burns-Crane	25.2	.....	.....	.....	.....	25.2	.....	.....
25	Redwood	42.4	.....	.....	.....	24.8	17.6	.....	.....
26	Mt. Hood	103.8	19.0	.....	21.8	63.0	.....	.....	.....
27	Alsea	59.0	.....	.....	.....	.....	59.0	.....	.....
28	Pendleton-Jn. Day	99.1	.....	.....	.....	.....	32.4	11.7	55.0
29	Tualatin	47.0	19.7	25.6	.....	.....	1.7	.....	.....
30	Salem-Dallas	14.9	14.9	.....	.....	.....	.....	.....	.....
31	Albany-Corvallis	10.5	0.4	10.1	.....	.....	.....	.....	.....
32	McMinnville-Tillamook	48.7	8.9	4.0	9.5	25.0	1.3	.....	.....
33	Corvallis-Newport	57.7	0.4	.....	.....	40.3	17.0	.....	.....
34	Siuslaw	67.0	.....	.....	.....	.....	43.9	.....	23.1
35	Coos Bay-Roseburg	61.8	0.3	0.1	9.0	13.5	38.9	.....	.....
36	Pendleton-Cold Sp.	30.4	.....	.....	.....	.....	29.4	.....	1.0
37	Umatilla Cut-off	19.8	.....	.....	.....	.....	.....	.....	19 8
38	Oregon Caves	19.1	.....	.....	.....	2.5	9.3	7.3	.....
40	Bertha-Beaverton	5.3	2.4	2.9	.....	.....	.....	.....	.....
41	Ochoco	104.9	.....	.....	.....	19.5	53.3	7.1	25.0
42	Sherman	69.0	.....	.....	.....	43 3	25.7	.....	.....
43	Monmouth-Independence	2.6	2.6	.....	.....	.....	.....	.....	.....
44	Wapinitia	40.6	.....	.....	.....	.....	26.9	12.8	0.9
	Totals	4,368.3	687.4	208.0	112.0	1,098.8	1,383.7	233.8	644.6

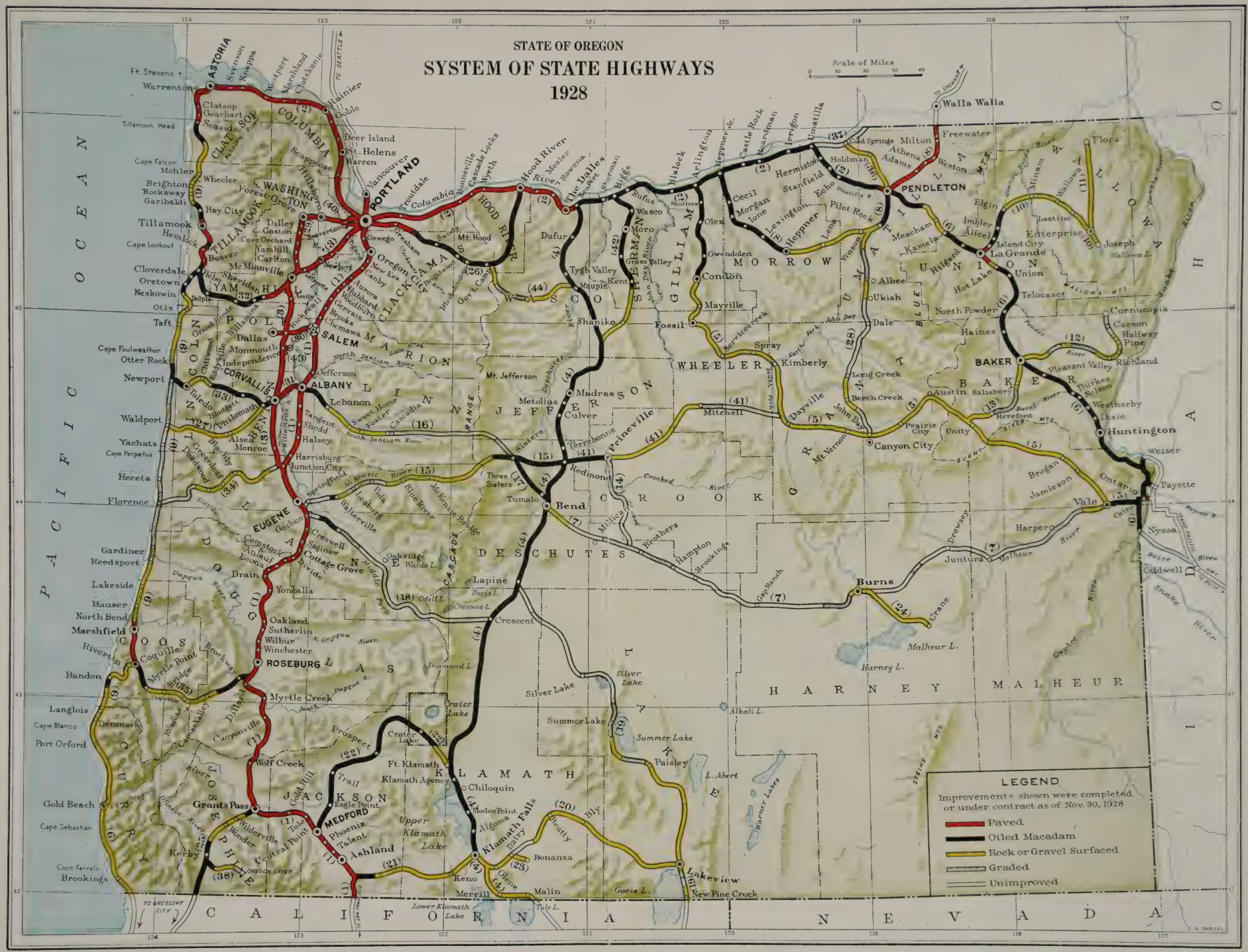

STATE OF OREG
SYSTEM OF STATE
1928
PACIFIC OCEAN
ASTORIA
Ft. Stevens
Warrenton
Clatsop
Gearhart
Seaside
Tillamook Head
Cape Falcon
Mohler
Brighton
Rockaway
Garibaldi
Wheeler
Bay City
Tillamook
Hemlock
Cape Lookout
Cloverdale
Oretown
Neskowin
Otis
Taft
Cape Foulweather
Otter Rock
Newport
Waldport
Yachats
Cape Perpetua
Heceta
Florence
Gardiner
Keedsport
Lakeside
Hauser
North Bend
Marshfield
Coquille
Riverton
Bandon
Langlois
Cape Blanco
Denmark
Port Orford
Gold Beach
Cape Sebastian
Cape Ferrelo
Brookings
Grants Pass
Kerby
Wolf Creek
Myrtle Creek
Canyonville
Roseburg
Winchester
Wilbur
Sutherlin
Oakland
Drain
Yoncalla
Cottage Grove
Creswell
Eugene
Goshen
Springfield
Junction City
Harrisburg
Halsey
Shedd
Tangent
Albany
Lebanon
Sweet Home
Corvallis
Philomath
Monroe
Alsea
Toledo
Independence
Monmouth
Dallas
Salem
Jefferson
Aumsville
Stayton
Mill City
Gates
Detroit
Idanha
Scio
Lyons
Mehama
Gervais
Woodburn
Hubbard
Aurora
Canby
Oregon City
Newberg
Dundee
Dayton
Lafayette
Amity
Sheridan
Dayton
Willamina
Grand Ronde
Chemawa
Turner
Marion
Salem
Santiam River
Willamette R.
Calapooia R.
Luckiamute R.
Yamhill
Carlton
Dilley
Gaston
Cove
Orchard
Forest Grove
Hillsboro
Beaverton
Rex
Tigard
Tualatin
Sherwood
Newberg
Oswego
Gresham
Portland
Vancouver
Troutdale
Columbia
Bonneville
Cascade Locks
Wyeth
Hood River
Mosier
Rowena
The Dalles
Seufert
Dufur
Tygh Valley
Maupin
Shanil
Mt. Hood
Sandy
Govt. Camp
Mt. Jefferson
Metolius
Madras
Culver
Terrebonne
Redmond
Sisters
Three Sisters
Tumalo
Bend
Deschutes R.
Deschutes
Crooked R.
Ochoco
Prineville
Mitchell
Fossil
Condon
Wasco
Shaniko
Grass Valley
Moro
Antelope
Kent
Grass Valley
Madras
Metolius
Culver
Terrebonne
Redmond
Sisters
Three Sisters
Tumalo
Bend
Deschutes R.

TABLE No. 19

STATE HIGHWAYS
LENGTHS AND MILEAGES OF DIFFERENT TYPES OF IMPROVEMENT

The mileages given in this table are inclusive of mileages within cities and towns.

Highway No.	Highway Name	Total Length in Miles	Miles of Different Types of Improvement						
			Paved With Bituminous Pavement	Paved With Concrete Pavement	Bituminous Macadam Surfacing	Oiled Rock or Gravel Surfacing	Unoiled Rock or Gravel Surfacing	Graded to State Standards	Not Graded to State Standards
1	Pacific	353.7	274.9	76.7	0.6	1.5	.....	.....	.....
2	Columbia River	336.3	188.6	12.4	5.9	129.4	.....	.....	.....
3	West Side Pacific	112.2	64.1	47.7	0.4	.....	.....	.....	.....
4	The Dalles-Calif.	317.2	5.5	.....	1.4	280.3	30.0	.....	.....
5	John Day	293.2	0.1	.....	.....	51.1	242.0	.....	.....
6	Old Oregon Trail	208.0	10.4	1.0	2.0	171.4	23.2	.....	.....
7	Central Oregon	258.0	0.3	.....	.....	.....	27.0	43.7	187.0
8	Oregon-Washington	145.3	38.3	.....	.....	61.6	45.4	.....	.....
9	Roosevelt Coast	404.7	30.7	27.3	7.4	46.7	213.7	12.3	66.6
10	La Grande-Wallowa Lake	73.2	3.3	.....	5.4	12.5	52.0	.....	.....
11	Enterprise-Flora	35.0	.....	.....	.....	.....	35.0	.....	.....
12	Baker-Cornucopia	75.6	0.3	.....	.....	.....	36.4	27.0	11.9
13	Baker-Unity	46.1	.....	.....	.....	.....	25.4	20.7	.....
14	Prineville-Bear Ck.	41.0	.....	.....	.....	.....	.....	28.4	12.6
15	McKenzie	112.6	0.5	0.2	.....	30.7	55.3	.....	25.9
16	Santiam	103.5	0.8	.....	.....	13.2	13.7	26.6	49.2
17	McKenzie-Bend	17.4	.....	.....	.....	17.4	.....	.....	.....
18	Willamette	99.0	.....	.....	.....	8.1	.....	7.1	83.8
19	Fremont	158.8	.....	.....	.....	.....	63.0	21.5	74.3
20	Klamath Falls-Lakeview	92.0	.....	.....	.....	.....	75.9	7.6	8.5
21	Ashland-Klamath Falls	57.2	0.6	.....	.....	9.4	47.2	.....	.....
22	Crater Lake	92.8	0.4	.....	48.6	33.6	10.2	.....	.....
23	Dairy-Bonanza	6.7	.....	.....	.....	.....	6.7	.....	.....
24	Burns-Crane	25.2	.....	.....	.....	.....	25.2	.....	.....
25	Redwood	42.4	.....	.....	.....	24.8	17.6	.....	.....
26	Mt. Hood	103.8	19.0	.....	21.8	63.0	.....	.....	.....
27	Alsea	59.0	.....	.....	.....	.....	59.0	.....	.....
28	Pendleton-Jn. Day	99.1	.....	.....	.....	.....	32.4	11.7	55.0
29	Tualatin	47.0	19.7	25.6	.....	.....	1.7	.....	.....
30	Salem-Dallas	14.9	14.9	.....	.....	.....	.....	.....	.....
31	Albany-Corvallis	10.5	0.4	10.1	.....	.....	.....	.....	.....
32	McMinnville-Tillamook	48.7	8.9	4.0	9.5	25.0	1.3	.....	.....
33	Corvallis-Newport	57.7	0.4	.....	.....	40.3	17.0	.....	.....
34	Siuslaw	67.0	.....	.....	.....	.....	43.9	.....	23.1
35	Coos Bay-Roseburg	61.8	0.3	0.1	9.0	13.5	38.9	.....	.....
36	Pendleton-Cold Sp.	30.4	.....	.....	.....	.....	29.4	.....	1.0
37	Umatilla Cut-off	19.8	.....	.....	.....	.....	.....	.....	19 8
38	Oregon Caves	19.1	.....	.....	.....	2.5	9.3	7.3	.....
40	Bertha-Beaverton	5.3	2.4	2.9	.....	.....	.....	.....	.....
41	Ochoco	104.9	.....	.....	.....	19.5	53.3	7.1	25.0
42	Sherman	69.0	.....	.....	.....	43 3	25.7	.....	.....
43	Monmouth-Independence	2.6	2.6	.....	.....	.....	.....	.....	.....
44	Wapinitia	40.6	.....	.....	.....	.....	26.9	12.8	0.9
	Totals	4,368.3	687.4	208.0	112.0	1,098.8	1,383.7	233.8	644.6


STATE OF OREGON
SYSTEM OF STATE HIGHWAYS
1928
Scale of Miles
0 10 20 30 40
LEGEND
Improvements shown were completed or under contract as of Nov. 30, 1928
Paved
Oiled Macadam
Rock or Gravel Surfaced
Graded
Unimproved
PACIFIC OCEAN
CALIFORNIA
NEVADA
IDAHO
ASTORIA
PORTLAND
SALEM
ALBANY
EUGENE
ROSEBURG
MARSHFIELD
COOS BAY
MEDFORD
GRANTS PASS
KLAMATH FALLS
LAKEVIEW
PENDLETON
BAKER
LA GRANDE
HUNTINGTON
BEND
PRINEVILLE
CANYON CITY
JOHN DAY
CONDON
HEPPNER
ARLINGTON
THE DALLES
HOOD RIVER
WASCO
MORO
FOSSIL
SHANIKO
MAUPIN
MADRAS
CULVER
METOLIUS
REDMOND
SISTERS
TUMALO
LA PINE
CRESCENT
CHILOQUIN
KLAMATH AGENCY
FT. KLAMATH
PAISLEY
SUMMER LAKE
LAKEVIEW
BURNS
HARNEY
MALHEUR
ONTARIO
VALE
NYSSA
PAYETTE
WEISER
CALDWELL
WALLA WALLA
FREEWATER
MILTON
ATHENA
WESTON
PILOT ROCK
STANFIELD
HERMISTON
IRRIGON
UMATILLA
BOARDMAN
CASTLE ROCK
BIGGS
RUFUS
SHERMAN
GILLIAM
MORROW
UMATILLA
WALLOWA
UNION
BAKER
WHEELER
GRANT
CROOK
DESCHUTES
JEFFERSON
LINN
BENTON
LINCOLN
POLK
MARION
CLACKAMAS
WASHINGTON
COLUMBIA
CLATSOP
TILLAMOOK
YAMHILL
HOOD RIVER
WASCO
SHERMAN
GILLIAM
MORROW
UMATILLA
UNION
WALLOWA
BAKER
WHEELER
GRANT
CROOK
DESCHUTES
JEFFERSON
LINN
BENTON
LINCOLN
POLK
MARION
CLACKAMAS
WASHINGTON
COLUMBIA
CLATSOP
TILLAMOOK
YAMHILL
HOOD RIVER
Astoria
Warrenton
Ft. Stevens
Clatsop
Gearhart
Seaside
Tillamook Head
Cape Falcon
Mohler
Wheeler
Brighton
Rockaway
Garibaldi
Bay City
Tillamook
Hemlock
Cape Lookout
Cloverdale
Oretown
Neskowin
Otis
Taft
Cape Foulweather
Otter Rock
Newport
Waldport
Yachats
Cape Perpetua
Heceta
Florence
Gardiner
Reedsport
Lakeside
Hauser
North Bend
Marshfield
Coquille
Riverton
Bandon
Langlois
Cape Blanco
Port Orford
Gold Beach
Cape Sebastian
Cape Ferrelo
Brookings
Kerby
Grants Pass
Wolf Creek
Canyonville
Myrtle Creek
Myrtle Point
Coquille
Denmark
Oakland
Sutherlin
Wilbur
Winchester
Drain
Yoncalla
Cottage Grove
Creswell
Saginaw
Goshen
Springfield
Harrisburg
Junction City
Halsey
Shedd
Tangent
Albany
Lebanon
Sweet Home
Foster
Cascadia
Jefferson
Monmouth
Independence
Dallas
Rickreall
Dolphin
Sheridan
McMinnville
Beaver
Carlton
Yamhill
Dilley
Gaston
Cove Orchard
Namhill
Forest Grove
Hillsboro
Scappoose
Clatskanie
Rainier
Goble
St. Helens
Deer Island
Warren
Vancouver
Troutdale
Portland
Columbia
Bonneville
Cascade Locks
Wyeth
Hood River
Mosier
Rowena
The Dalles
Sherman
Biggs
Rufus
Wasco
Moro
Grass Valley
Shaniko
Kent
Tygh Valley
Maupin
Dufur
Mt. Hood
Sandy
Oregon City
Gladstone
Estacada
Molalla
Canby
New Era
Aurora
Hubbard
Woodburn
Gervais
Brooks
Chemawa
Salem
Turner
Marion
Aumsville
Stayton
Sublimity
Scio
Lyons
Mehama
Gates
Detroit
Idanha
Mill City
Lyons
Albany
Tangent
Shedd
Halsey
Harrisburg
Junction City
Monroe
Alsea
Toledo
Siletz
Blodgett
Philomath
Corvallis

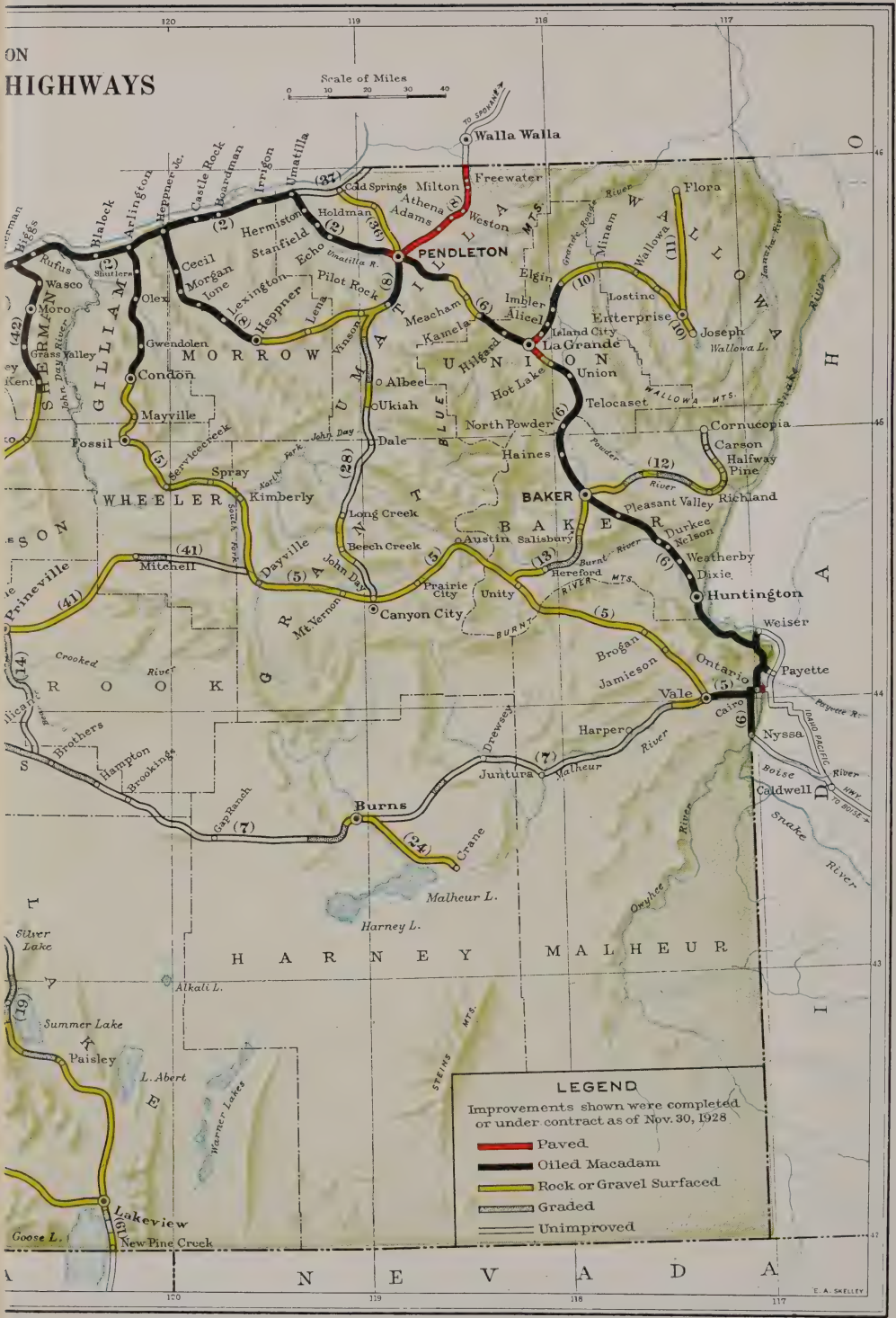

ON
HIGHWAYS
Scale of Miles
0 10 20 30 40
Walla Walla
Freewater
Milton
Old Springs
Athena
Weston
Adams
PENDLETON
Pilot Rock
Holdman
Hermiston
Stanfield
Echo
Umatilla R.
Irrigon
Umatilla
Boardman
Castle Rock
Heppner Jc.
Arlington
Blalock
Rufus
Wasco
Moro
Grass Valley
Shutlers
Olex
Cecil
Morgan
Lone
Lexington
Heppner
Lena
Ione
Gwendolen
Condon
Mayville
Fossil
Kent
Spray
Kimberly
Service Creek
John Day
North Fork
South Fork
Dayville
Mitchell
Prineville
Crooked River
Mt. Vernon
Canyon City
Prairie City
Long Creek
Beech Creek
Austin
Salisbury
Unity
Hereford
Burnt River
Burnt
Mts.
Dale
Albee
Ukiah
Vinson
Meacham
Kamela
Hilgard
La Grande
Island City
Union
Hot Lake
North Powder
Haines
Baker
Pleasant Valley
Richland
Durkee
Nelson
Weatherby
Dixie
Huntington
Weiser
Payette
Ontario
Vale
Brogan
Jamieson
Cairo
Nyssa
Harper
Juntura
Malheur River
Drewsey
Burns
Crane
Gap Ranch
Brothers
Hampton
Brookings
Malheur L.
Harney L.
Alkali L.
Silver Lake
Summer Lake
Paisley
L. Abert
Warner Lakes
Lakeview
New Pine Creek
Goose L.
Steins Mts.
Owyhee River
Snake River
Boise River
Payette R.
Idaho Pacific
Caldwell
To Boise
Imbler
Elgin
Minam
Wallowa
Enterprise
Lostine
Joseph
Wallowa L.
Flora
Imnaha River
Wallowa Mts.
Telocaset
Cornucopia
Carson
Halfway
Pine
Powder River
Grande Ronde River
Lostine River
Wallowa River
Imnaha River
Blue Mts.
Ochoco Mts.
Harney
Malheur
Morrow
Gilliam
Sherman
Wheeler
Grant
Baker
Union
Wallowa
Idaho
Oregon
Nevada
LEGEND
Improvements shown were completed or under contract as of Nov. 30, 1928
Paved
Oiled Macadam
Rock or Gravel Surfaced
Graded
Unimproved
E. A. SKELLEY

TABLE No. 20

CONTINUING STATEMENT OF EQUIPMENT AND SUPPLIES ACCOUNT

In this table are summarized the disbursements and credits entering into the State Equipment and Supplies Account since the commencement of the operation of the State Equipment Department. The difference between the total of the disbursements and the total of the credits (which difference is shown in the column headed "Total Net Cost 1917 to End of Period"), represents the net cost to the State of all equipment and supplies on hand (including shops and warehouses), the value of which is shown in the column headed "Inventory Value of Equipment and Supplies on Hand."

Period	Gross Expense	Total Credits	Net Cost for the Period	Total Net Cost, 1917, to End of Period	Inventory Value of Equipment and Supplies on Hand
1917–1918	$ 111,547.03	$ 24,829.48	$ 86,717.55	$ 86,717.55	$ 100.000.00
1919–1920	602,230.22	308,629.62	293,600.60	380,318.15	*1,500.000.00
1921	403,500.21	476,502.73	Cr 73,002.52	370,315.63	† 825,000.00
1922	357,921.30	387,873.24	Cr 29,951.94	277,363.69	759,325.00
1923	487,118.10	575,851.80	Cr 88,733.70	188,629.99	993,769.89
1924	615,373.69	670,141.27	Cr 54,767.58	133,862.41	970,267.20
1925	834,605.68	867,512.23	Cr 32,906.55	100,955.86	1,012,692.68
1926	973,318.39	1,005,373.79	Cr 32,055.40	68,900.46	1,205,984.66
1927	1,307,984.71	1,192,846.12	115,138.59	184,039.05	1,371,859.56
1928	1,517,407.20	1,587,622.61	Cr 70,215.41	113,823.64	1,369,458.66
1917–1928	$7,211,006.53	$7,097,182.89	$ 113,823.64	$ 113,823.64	$1,369,458.66

* During 1919 and 1920, the state received from the federal government a large amount of surplus war equipment (trucks, tractors, etc.) The inventory value of this equipment was greatly in excess of its cost to the state.

† During 1921, much of the surplus war equipment received from the federal government in 1919 and 1920 was turned over to the counties. This accounts for the large decrease in the inventory value of equipment on hand.

TABLE No. 21

CONDENSED INVENTORY OF EQUIPMENT, SHOPS AND WAREHOUSES

November 1, 1928

Maintenance and Construction Equipment	$ 741,940.00
Salem Shops and Warehouse Buildings	48,052.62
Salem Shops and Warehouse Equipment and Tools	36,285.26
Salem Stock Materials, Supplies and Repair Parts	298,523.13
La Grande Shops and Warehouse Buildings	51,302.59
La Grande Shops and Warehouse Equipment and Tools	5,905.45
La Grande Stock Materials, Supplies and Repair Parts	50,492.34
La Grande Shop Site	2,375.00
Klamath Falls Shops and Warehouse Buildings	25,632.14
Klamath Falls Shops and Warehouse Equipment and Tools	15,170.33
Klamath Falls Stock Materials, Supplies and Repair Parts	30,867.53
Klamath Falls Shop Site	2,100.00
Coquille Shops and Warehouse Buildings	23,359.58
Coquille Shops and Warehouse Equipment and Tools	8,883.63
Coquille Stock Materials, Supplies and Repair Parts	24,569.06
Coquille Shop Site	4,000.00
Total inventory value	$1,369,458.66

TABLE No. 22

RECORD OF EQUIPMENT ACQUIRED, EQUIPMENT DISPOSED OF AND EQUIPMENT ON HAND

Period November 1, 1926, to November 1, 1928

This table gives inventories of the heavy construction and maintenance equipment owned by the State Highway Department as of November 1, 1926, and as of November 1, 1928. It also gives an accounting for all heavy equipment acquired or disposed of during the two-year period between those dates.

Description	Number on hand November 1, 1926	Number purchased 1927-1928	Number converted from other equipment	Total	Allotted and/or sold to cities, counties, state institutions, and others	Disposed of as obsolete, unserviceable, and/or unsuitable, 1927-1928	Converted to other type of equipment, 1927-1928	Number on hand November 1, 1928
Trucks								
Chevrolet	.....	50	.....	50	.....	.....	.....	50
Dodge, 1 ton	1	.....	.....	1	.....	.....	.....	1
Dodge, 1½ ton	.....	4	.....	4	.....	.....	.....	4
Ford	22	48	.....	70	.....	11	.....	59
F. W. D., 2 ton	.....	5	.....	5	.....	.....	.....	5
F. W. D. (Gov. 3 ton)	51	.....	1	52	.....	14	.....	38
F. W. D., 3 ton	.....	1	.....	1	.....	.....	.....	1
G. M. C. (Gov. 1 ton)	26	.....	.....	26	.....	21	.....	5
G. M. C., 1 ton	.....	1	.....	1	.....	.....	.....	1
Heavy Aviation, 3 ton	8	.....	.....	8	2	3	.....	3
Indiana, 5 ton	1	.....	.....	1	.....	.....	.....	1
Liberty, 3 ton	56	.....	.....	56	.....	.....	.....	56
Moreland, 4 ton	5	.....	.....	5	2	.....	.....	3
Nash Quad, 2 ton	41	.....	.....	41	.....	4	.....	37
Packard, 1½ ton	25	.....	.....	25	.....	1	.....	24
Packard, 3 ton	1	.....	.....	1	.....	.....	.....	1
Pierce Arrow, 2 ton	7	.....	.....	7	.....	.....	.....	7
Pierce Arrow, 5 ton	19	.....	.....	19	.....	8	.....	11
Riker, 3 ton	.....	* 1	.....	1	.....	.....	.....	1
Standard, 3½ ton	10	.....	.....	10	.....	2	.....	8
White Staff, 1 ton	2	.....	.....	2	.....	.....	.....	2
White, 1½ ton	30	.....	.....	30	.....	.....	.....	30
Totals	305	110	1	416	4	64	.....	348
Automobiles								
Buick Touring	8	.....	.....	8	.....	5	.....	3
Buick Sedan	.....	3	.....	3	.....	.....	.....	3
Buick Roadster	7	.....	.....	7	.....	3	.....	4
Buick Coupe	.....	12	.....	12	.....	.....	.....	12
Cadillac Touring	1	.....	.....	1	.....	.....	.....	1
Cadillac Light Delivery	.....	.....	† 1	1	.....	.....	.....	1
Chevrolet Touring	.....	4	.....	4	.....	.....	.....	4
Dodge Touring	2	1	.....	3	.....	1	.....	2
Dodge Roadster	8	2	.....	10	.....	6	.....	4
Dodge Coupe	.....	6	.....	6	.....	.....	.....	6
Ford Touring	55	19	.....	74	.....	22	4	48
Ford Light Delivery	38	.....	4	42	.....	27	.....	15
Ford Roadster	2	.....	.....	2	.....	.....	2	.....
Ford Roadster, Del. Body	8	1	2	11	.....	2	.....	9
Ford Coupe	.....	1	.....	1	.....	.....	.....	1
Oakland Coach	.....	2	.....	2	.....	.....	.....	2
Oakland Coupe	.....	2	.....	2	.....	.....	.....	2
Oldsmobile Coupe	.....	2	.....	2	.....	.....	.....	2
Studebaker Touring	2	.....	.....	2	.....	2	.....	.....
Studebaker Roadster	1	.....	.....	1	.....	.....	.....	1
Totals	132	55	7	194	.....	68	6	120

* Received from Oregon State College R. O. T. C.
† Allotted on former report, later returned and converted to service car.

TABLE No. 22—Continued

Description	Number on hand November 1, 1926	Number purchased 1927-1928	Number converted from other equipment	Total	Allotted and/or sold to cities, counties, state institutions, and others	Disposed of as obsolete, unserviceable, and/or unsuitable, 1927-1928	Converted to other type of equipment, 1927-1928	Number on hand November 1, 1928
Motorcycles								
Harley Davidson	7	14	.....	21	.....	13	.....	8
Indian Scout	.....	1	.....	1	.....	.....	.....	1
Totals	7	15	.....	22	.....	13	.....	9
Tractors								
Case, J. I. (steam)	1	.....	.....	1	.....	.....	1	.....
Caterpillar, 2 ton	.....	2	.....	2	.....	.....	.....	2
Caterpillar (snow special)	.....	1	.....	1	.....	.....	.....	1
Fordson	4	20	.....	24	.....	1	.....	23
Holt, 2½ ton	7	.....	.....	7	.....	4	.....	3
Holt, 5 ton	20	.....	.....	20	.....	3	.....	17
Holt, 10 ton	5	.....	.....	5	.....	.....	.....	5
Holt, 20 ton	3	.....	.....	3	.....	2	.....	1
McCormick Deering	9	26	.....	35	.....	.....	.....	35
Totals	49	49	.....	98	.....	10	1	87
Miscellaneous Equipment								
Air Compressors	3	1	.....	4	.....	.....	.....	4
Asphalt Kettles	11	56	.....	67	46	3	.....	18
Belt Conveyer	1	.....	.....	1	.....	.....	.....	1
Buckets	6	.....	.....	6	1	1	.....	4
Boilers	6	11	2	19	.....	.....	.....	19
Concrete Mixers	2	3	.....	5	.....	.....	2	3
Asphalt Mixers	.....	.....	2	2	.....	.....	.....	2
Crane	1	.....	.....	1	.....	.....	.....	1
Crushers	1	.....	.....	1	1	.....	.....	.....
Drag Line	1	.....	.....	1	.....	.....	.....	1
Drags (maintainers)	.....	7	.....	7	.....	.....	.....	7
Drills	.....	1	1	2	.....	.....	.....	2
Excavators	1	2	.....	3	.....	.....	.....	3
Gas Service Stations	4	.....	.....	4	.....	.....	.....	4
Graders	106	32	.....	138	7	10	.....	121
Hoists	4	.....	.....	4	.....	.....	.....	4
Hydraulic Jacks and Jack Hammers	.....	.....	‡ 17	17	.....	.....	.....	17
Loaders	1	10	.....	11	.....	.....	.....	11
Mowers	3	5	.....	8	7	.....	.....	1
Portable Paving Plants	2	.....	.....	2	.....	.....	.....	2
Power Units	6	.....	.....	6	1	.....	1	4
Pump Units	32	3	1	36	2	.....	1	33
Retorts	.....	9	.....	9	.....	.....	.....	9
Road Rollers	4	1	.....	5	.....	.....	.....	5
Sand Spreaders	3	.....	.....	3	.....	.....	.....	3
Snow Plows (tractor, m.b.)	20	.....	.....	20	.....	4	1	15
Snow Plows (tractor rotary)	4	1	.....	5	.....	.....	1	4
Snow Plows (tractor, m.b.)	43	7	1	51	.....	.....	.....	51
Snow Plows (truck rotary)	1	2	1	4	.....	.....	.....	4
Snow Plows, grader attachment	.....	8	.....	8	.....	.....	.....	8
Street Burners	4	2	.....	6	1	.....	.....	5
Street Sweepers	4	7	.....	11	.....	.....	.....	11
Traffic Markers	2	2	.....	4	2	.....	.....	2
Trailers	19	45	1	65	1	.....	.....	64
Tool Heaters	2	.....	.....	2	.....	.....	.....	2
Wood Saws	2	.....	.....	2	.....	1	.....	1
Road Magnet	.....	1	.....	1	.....	.....	.....	1
Engineering Equipment								
Transits	92	.....	.....	92	2	.....	.....	90
Levels	66	.....	.....	66	.....	.....	.....	66

‡ Reconditioned from government material previously received and accounted for.

TABLE No. 23

MILEAGES OF WORK PERFORMED

December 1, 1926, to November 30, 1928

This table shows by section and by mileage the highway construction work, reconstruction work, and betterment work performed on the state highway system under the direct supervision of the State Highway Commission during the period from December 1, 1926, to November 30, 1928. It does not include forest highway work, which work is performed under the supervision of the United States Bureau of Public Roads. Neither does it include work performed by county forces or work performed under county contracts.

County and Section	Mileages						
	Concrete Paving	Rock and Gravel Surfacing	Grading	Bituminous Macadam Top	Oiling	Resurfacing	Regrading and Roadbed Widening
BAKER COUNTY							
Dry Gulch Section (Highway No. 12)	.....	5.50	.....	.....	.....	.....	.....
Unity-Hereford	.....	14.50	10.52	.....	.....	.....	.....
Timber Canyon Section (Highway No. 12)	.....	.....	3.55	.....	.....	.....	.....
Unity-Malheur County Line	.....	10.33	.....	.....	.....	.....	.....
Totals for Baker County	.....	30.33	14.07	.....	.....	.....	.....
BENTON COUNTY							
Alsea Mountain-Philomath	.....	6.16	5.33	.....	.....	.....	.....
Missouri Bend-Alsea Mountain	.....	8.68	0.48	.....	.....	.....	.....
Gellatly Point-Corvallis	.....	7.20	0.52	.....	.....	.....	.....
Albany-Corvallis	0.36	.....	.....	.....	.....	.....	.....
Lincoln County Line-Blodgett	.....	.....	.....	.....	.....	8.04	6.04
Alsea Mountain Section	.....	.....	.....	.....	.....	5.88	.....
Keyes Hill and Noon Sections	.....	.....	.....	.....	.....	2.30	.....
Corvallis-Lincoln County Line	.....	.....	.....	.....	20.35	.....	.....
Totals for Benton County	0.36	22.04	6.33	.....	20.35	16.22	6.04
CLACKAMAS COUNTY							
Sandy-Forest Boundary	.....	.....	.....	17.42	.....	1.50	.....
Forest Boundary-Rhododendron	.....	.....	.....	2.56	.....	0.62	.....
Canemah-New Era	.....	.....	.....	.....	.....	1.61	4.50
Totals for Clackamas County	.....	.....	.....	19.98	.....	3.73	4.50

CLATSOP COUNTY							
Lewis and Clark Bridge Approaches	0.27						
Seaside-Hamlet Junction				3.00	12.97		
Soapstone Creek Bridge Approaches						0.28	0.28
Astoria-Svensen					0.20		
Totals for Clatsop County	0.27			3.00	13.17	0.28	0.28
COOS COUNTY							
Douglas County Line-Lakeside		2.45	1.35				
Coquille-Riverton						3.60	
Bandon-South					3.30		
Myrtle Point-Coquille				9.01	9.00		
Totals for Coos County		2.45	1.35	9.01	12.30	3.60	
CURRY COUNTY							
Burnt Hill-Chetco River			1.20				
Myers Creek-Chetco River		28.18					
Totals for Curry County		28.18	1.20				
DESCHUTES COUNTY							
Millican-Hampton			27.00				
Sisters-West					8.03		
Sisters-Redmond					20.09		
Bend-Lava Butte					9.06		
Lapine-Klamath County Line					4.34		
Sisters Junction-Bend					18.60		
Jefferson County Line-South					1.40		
Totals for Deschutes County			27.00		61.52		
DOUGLAS COUNTY							
Gardiner Summit Section			1.95				
Reedsport Section		1.06	1.06				
Winchester Bay-Douglas County Line			5.57				
Reedsport-Winchester Bay			1.79				
Reedsport-Douglas County Line		8.87					
Camas Mountain-Pacific Highway					12.10		
Totals for Douglas County		9.93	10.37		12.10		
GILLIAM COUNTY							
Arlington-Shutler Creek						11.00	
Olex-Condon					16.56		
Heppner Junction-Morrow County Line (Hwy. No. 8)					9.59		
Arlington-Juniper Canyon (Highway No. 5)					21.20		
Totals for Gilliam County					47.35	11.00	

TABLE No. 23—Continued

County and Section	Mileages						
	Concrete Paving	Rock and Gravel Surfacing	Grading	Bituminous Macadam Top	Oiling	Resurfacing	Regrading and Roadbed Widening
HARNEY COUNTY							
Buchannan-Nigger Flat (Highway No. 7)	.....	.....	3.43	.....	.....	.....	.....
Totals for Harney County	.....	.....	3.43	.....	.....	.....	.....
HOOD RIVER COUNTY							
Blue Bucket Section (Highway No. 26)	.....	.....	.....	1.80	.....	.....	.....
Totals for Hood River County	.....	.....	.....	1.80	.....	.....	.....
JACKSON COUNTY							
Gold Hill Bridge Approaches	.....	0.32	0.32	0.59	.....	.....	.....
Pacific Highway-Keene Creek (Highway No. 21)	.....	.....	.....	.....	9.40	11.00	.....
Medford-Eagle Point	.....	.....	.....	.....	.....	8.40	.....
Prospect-Forest Boundary	.....	.....	.....	.....	22.02	.....	.....
Trail-Prospect	.....	.....	.....	22.24	.....	.....	.....
Medford-Trail	.....	.....	.....	23.32	.....	.....	.....
Totals for Jackson County	.....	0.32	0.32	46.15	31.42	19.40	.....
JEFFERSON COUNTY							
Metolius Cut-off	.....	.....	.....	.....	.....	0.98	0.98
Through Jefferson County (Highway No. 4)	.....	.....	.....	.....	38.30	.....	.....
Totals for Jefferson County	.....	.....	.....	.....	38.30	0.98	0.98
JOSEPHINE COUNTY							
Deer Creek-Hayes Hill (Highway No. 25)	.....	4.80	4.80	.....	.....	.....	.....
Hayes Hill-Shattuck Corner (Highway No. 25)	.....	10.77	10.69	.....	.....	.....	.....
Hayes Hill Section (Highway No. 25)	.....	.....	.....	.....	.....	1.87	.....
Applegate River-Grants Pass (Highway No. 25)	.....	.....	.....	.....	4.00	.....	.....
California Line-Deer Creek (Highway No. 25)	.....	.....	.....	.....	20.81	.....	.....
Redwood Highway-Chapman Creek (Highway No. 38)	.....	.....	.....	.....	2.30	.....	.....
Totals for Josephine County	.....	15.57	15.49	.....	27.11	1.87	.....
KLAMATH COUNTY							
Beatty-Bly	.....	.....	1.00	.....	.....	.....	.....
Bly-Forest Boundary	.....	.....	8.01	.....	.....	.....	.....
Beatty-Forest Boundary	.....	13.60	.....	.....	.....	.....	.....

Klamath Falls-Merrill-Olene						15.90	
Keno-Klamath Falls						11.00	
Deschutes County Line-Algoma Point					98.63		
Totals for Klamath County		13.60	9.01		98.63	26.90	
LAKE COUNTY							
Drews Valley-Lakeview (Highway No. 20)		16.09					
Chalk Cliff-Paisley			9.48				
Ana Spring-Hunter Hill (Highway No. 19)			3.50				
Totals for Lake County		16.09	12.98				
LANE COUNTY							
East Unit, Lowell-Goodman Creek			3.49				
West Unit, Lowell-Goodman Creek			2.00				
Pleasant Valley-Lowell					8.04		
Springfield-Walterville					11.31		
Low Pass Summit-Goldson						11.20	
Totals for Lane County			5.49		19.35	11.20	
LINCOLN COUNTY							
Siletz Bay-Otter Rock		12.75					
Otter Rock-Newport					8.49		
Newport-Toledo					7.96		
Eddyville-Benton County Line					11.40	11.38	7.38
Totals for Lincoln County		12.75			27.85	11.38	7.38
LINN COUNTY							
Harrisburg Bridge Approaches	0.18						
East Approach, Albany Bridge	0.02						
Albany-Lebanon					13.00		
Lebanon-Sheas' Hill		2.00	17.24				
Totals for Linn County	0.20	2.00	17.24		13.00		
MALHEUR COUNTY							
Baker County Line-Ironside		8.87					
Ironside-Cow Valley		10.00					
Cow Valley-Brogan		6.10					6.10
Vale-Cairo					12.12		
Ontario-Nyssa					8.50		
Totals for Malheur County		24.97			20.62		6.10

TABLE No. 23—Continued

County and Section	Mileages						
	Concrete Paving	Rock and Gravel Surfacing	Grading	Bituminous Macadam Top	Oiling	Resurfacing	Regrading and Roadbed Widening
MORROW COUNTY							
Jones Hill-Lena (Highway No. 8)	.....	2.88	.....	.....	.....	.....	.....
Lena-Umatilla County Line	.....	11.10	.....	.....	.....	.....	.....
Gilliam County Line-Ione	.....	.....	.....	.....	18.90	.....	.....
Ione-Heppner	.....	.....	.....	.....	18.91	.....	.....
Jones Hill Section (Highway No. 8)	.....	.....	.....	.....	.....	0.97	.....
Totals for Morrow County	.....	13.98	.....	.....	37.81	0.97	.....
POLK COUNTY							
Valley Junction Section (Highway No. 32)	.....	.....	.....	.....	.....	0.74	0.74
Willamina-Butlers Store (Highway No. 32)	.....	.....	.....	5.09	.....	.....	.....
Holmes Gap (Highway No. 3)	.....	.....	.....	0.39	.....	0.36	0.36
Totals for Polk County	.....	.....	.....	5.48	.....	1.10	1.10
SHERMAN COUNTY							
John Day River Bridge Approaches	.....	.....	.....	.....	.....	0.01	0.01
Wasco-Grass Valley	.....	.....	.....	.....	18.10	.....	.....
Grass Valley-Kent	.....	.....	.....	.....	14.60	.....	.....
Totals for Sherman County	.....	.....	.....	.....	32.70	0.01	0.01
TILLAMOOK COUNTY							
Wheeler Section	.....	0.33	0.23	.....	.....	.....	.....
Garibaldi-Hobsonville	.....	3.43	2.21	.....	4.10	.....	.....
Mohler-Wheeler	.....	.....	0.80	.....	.....	.....	.....
Wheeler-Brighton	.....	.....	2.86	.....	.....	.....	.....
Garibaldi-Rockaway	.....	.....	4.36	.....	.....	.....	.....
Mohler-Garibaldi	.....	9.82	.....	.....	.....	.....	.....
Brighton-Rockaway	.....	.....	.....	.....	4.20	.....	.....
Hobsonville-Wilson River	.....	.....	.....	.....	6.20	.....	.....
Beaver-Hebo	.....	.....	.....	4.32	.....	.....	.....
Cloverdale-Neskowin	.....	.....	.....	.....	11.72	.....	.....
Hebo-Yamhill County Line	.....	.....	.....	.....	8.23	.....	.....
Totals for Tillamook County	.....	13.58	10.46	4.32	34.45	.....	.....

UMATILLA COUNTY							
Morrow County Line-Vinson	.....	4.00	.....	.....	.....	.....	.....
South Unit, Lazinka Ranch-Albee	.....	.....	6.00	.....	.....	.....	.....
Near Umatilla	.....	.....	.....	.....	.....	.....	0.75
Deadmans Pass-Kamela	.....	.....	.....	.....	.....	.....	2.00
Stanfield-Pendleton	.....	.....	.....	5.92	.....	.....	.....
Pendleton-Kamela	.....	.....	.....	1.33	.....	11.00	.....
Pilot Rock-McKay Creek	.....	.....	.....	.....	10.40	.....	.....
Totals for Umatilla County	.....	4.00	6.00	7.25	10.40	11.00	2.75
UNION COUNTY							
La Grande-Minam	.....	.....	.....	.....	.....	10.20	.....
Lone Pine-Hot Lake	.....	.....	.....	.....	.....	2.00	.....
Island City-Conley	.....	.....	.....	3.55	.....	.....	.....
Elgin Section	.....	.....	.....	1.82	.....	.....	.....
Lone Pine-East	.....	.....	.....	.83	.....	.....	.....
Totals for Umatilla County	.....	.....	.....	6.20	.....	12.20	.....
WALLOWA COUNTY							
Rock Creek-Lostine	.....	.....	.....	.....	.....	15.70	.....
Totals for Wallowa County	.....	.....	.....	.....	.....	15.70	.....
WASCO COUNTY							
Dufur-Maupin	.....	.....	.....	.....	27.58	.....	.....
Maupin-Jefferson County Line	.....	.....	.....	.....	28.81	.....	.....
Totals for Wasco County	.....	.....	.....	.....	56.39	.....	.....
WASHINGTON COUNTY							
Multnomah County Line-Beaverton	.....	.....	.....	.....	.....	.....	3.77
Totals for Washington County	.....	.....	.....	.....	.....	.....	3.77
WHEELER COUNTY							
Mitchell-Keyes Creek Summit	.....	.....	7.00	.....	.....	.....	.....
Fossil Section	.....	.....	.....	.....	0.70	.....	.....
Totals for Wheeler County	.....	.....	7.00	.....	0.70	.....	.....
YAMHILL COUNTY							
Sheridan-Willamina	.....	.....	.....	4.38	.....	.....	.....
Yamhill River-Polk County Line (Highway No. 32)	.....	.....	.....	.....	4.07	.....	.....
Bee Ranch-Polk County Line (Highway No. 32)	.....	.....	.....	.....	.....	7.14	.....
Totals for Yamhill County	.....	.....	.....	4.38	4.07	7.14	.....
Totals for Entire State	0.83	209.79	147.74	107.57	619.59	154.68	32.91

TABLE No. 24

MILEAGES OF SURVEYS MADE

December 1, 1926, to November 30, 1928

This table includes only surveys made for state highways and only surveys made under the supervision of the State Highway Commission. It does not include surveys for market roads or surveys made for state highways by the Bureau of Public Roads.

County and Section	Miles of Completed Surveys
BAKER COUNTY	
Halfway-Carson, location	5.68
Total for Baker County	5.68
CLACKAMAS COUNTY	
Canemah-Canby, revision	3.65
Oswego-Multnomah County Line, revision	0.90
Total for Clackamas County	4.55
CLATSOP COUNTY	
Big Noise Creek-Rock Creek, revision	0.79
Big Creek Section, revision	1.79
Total for Clatsop County	2.58
COLUMBIA COUNTY	
Clatskanie-Clatsop County Line (Fall Creek Section), revision	0.23
Total for Columbia County	0.23
COOS COUNTY	
Larson Slough-Haynes Slough, revision	0.89
Lakeside Undercrossing Section, location	0.19
Total for Coos County	1.08
CURRY COUNTY	
Approaches to Rogue River Ferry, location	0.61
Total for Curry County	0.61
DESCHUTES COUNTY	
Bend-North, revision	4.10
Total for Deschutes County	4.10
DESCHUTES, LAKE AND HARNEY COUNTIES	
Millican-Sage Hen Hill, location	*114.79
Total for this survey	114.79
DESCHUTES, KLAMATH AND LAKE COUNTIES	
Lapine-Picture Rock Pass, location	† 63.01
Total for this survey	63.01
DOUGLAS COUNTY	
Roosevelt Coast Highway across County, relocation	6.00
Rice Hill-Oakland, relocation	5.10
Reedsport Section, location	1.06
Total for Douglas County	12.16
GILLIAM COUNTY	
Section west of Arlington, revision	1.00
Total for Gilliam County	1.00
GRANT COUNTY	
Forest Boundary-John Day, location	11.62
Total for Grant County	11.62
HARNEY COUNTY	
Buchanan-Vanderveer, location	3.43
Total for Harney County	3.43
JACKSON COUNTY	
Gold Hill-Medford, revision	8.00
Total for Jackson County	8.00

* Consists of 68.17 miles in Deschutes County, 14.38 miles in Lake County, and 32.24 miles in Harney County.

† Consists of 1.44 miles in Deschutes County, 16.57 miles in Klamath County, and 45.00 miles in Lake County.

TABLE No. 24—Continued

County and Section	Miles of Completed Surveys
JOSEPHINE COUNTY	
Grants Pass-Applegate River, location	2.00
Applegate River-George Ranch, location	0.47
Grants Pass-Jackson County Line, revision	4.30
Wolf Creek-Grave Creek, revision	2.13
Total for Josephine County	8.90
KLAMATH COUNTY	
Bly-Forest Boundary, relocation	8.00
Jackson County Line-Klamath Falls, revision	2.00
Klamath Falls-Lakeview Junction, revision	3.72
Dairy-Bly Mountain, relocation	8.49
Total for Klamath County	22.21
LAKE COUNTY	
Picture Rock Pass-Hunter Creek, location	14.34
Lakeview-New Pine Creek, location	8.65
Total for Lake County	22.99
LANE COUNTY	
Florence-Douglas County Line, relocation	3.00
Lowell-Oakridge, location	14.67
Cheshire-Junction City, location	3.70
Springfield Lane-Cogswell Hill, location	3.00
Total for Lane County	24.37
LINCOLN COUNTY	
Newport-Waldport, location	10.00
Waldport-Yachats, location	7.00
Total for Lincoln County	17.00
LINN COUNTY	
Shea's Hill-Cascadia, location	1.00
Lebanon-Shea's Hill, location	17.14
Relocation through the "Narrows" near Sweet Home	1.20
Total for Linn County	19.34
MALHEUR COUNTY	
Jamieson-Vale, relocation	17.25
Total for Malheur County	17.25
POLK COUNTY	
Valley Junction Section, revision	0.81
New Grand Ronde-Old Grand Ronde, location	‡ 1.95
Total for Polk County	2.76
TILLAMOOK COUNTY	
Tillamook-Washington County Line (Wilson River Route)	14.33
Salmon River-Dolph, location	5.59
Total for Tillamook County	19.92
UMATILLA COUNTY	
Nolin Section, revision	1.08
Total for Umatilla County	1.08
UNION COUNTY	
Umatilla County Line-Hilgard, revision	14.63
Elgin-East, revision	1.14
Total for Union County	15.77
WASHINGTON COUNTY	
Beaverton-Multnomah County Line, revision	3.94
Tualatin River Bridge Section, revision	1.00
Total for Washington County	4.94
WHEELER COUNTY	
Mitchell-Dayville, relocation	‖ 25.40
Total for Wheeler County	25.40
YAMHILL COUNTY	
Sheridan-Willamina, revision	3.42
Total for Yamhill County	3.42
Total for the entire state	438.19

‡ Includes 0.38 miles in Yamhill County.
‖ Includes 1.59 miles in Grant County.

TABLE No. 25

SCHEDULE OF BRIDGES CONSTRUCTED, UNDER CONSTRUCTION OR DESIGNED, SPANS 20 FEET AND ABOVE

December 1, 1926, to November 30, 1928

All bridges listed in this table are located on state highways, or are designed for location on state highways. The status of each structure or design as of November 30, 1928, is indicated by means of the symbols which appear in the third column, the key to which is given at the bottom of each page.

For structure designs for counties, see Table No. 26.

Bridge No.	Location and Type of Structure	Status Nov. 30, 1928	Estimated Cost
	BENTON COUNTY		
1204	1-30′ R. C. span, 1-100′ steel pony truss span, 1-40′ R. C. span over the North Fork of the Alsea River about 18.5 miles west of Philomath on the Alsea Highway	a	$ 18,504.64
1205	212 lineal feet of R. C. viaduct over the Southern Pacific tracks on the Corvallis Highway near Wren Station	a	20,378.07
1206	4-19′ frame trestle spans, 1-100′ steel pony truss span, 4-19′ frame trestle spans over Mary's River at Sta. 3, Gellatly Canyon-Keys Hill Section, Corvallis-Newport Highway	a	15,572.44
1259	4-30′ continuous R. C. spans over Rock Creek at Station 1435, Alsea Mountain-Philomath Section, Alsea Highway	a	9,118.39
	CLACKAMAS COUNTY		
580	3-30′, 1-60′, 3-30′ continuous R. C. spans, 27′ roadway, 2-4′-6″ sidewalks over Parrott Creek on Pacific Highway at New Era	a	35,100.00
1347	28′x72′ framed equipment shed at Government Camp on Mt. Hood Loop Highway	a	3,869.72
	CLATSOP COUNTY		
1319	1-20′ R. C. span, 1-108′ skewed R. C. arch, 1-20′ R. C. span over Soapstone Creek on the Seaside-Tillamook County Line Section, Roosevelt Coast Highway	a	25,877.37
	COOS COUNTY		
1209	10-19′ pile trestle spans, 1-41′ "I" beam span, 10-19′ pile trestle spans over North Slough on the Roosevelt Coast Highway near Hauser	a	9,933.74
1367	Roosevelt Ferry over Coos Bay between North Bend and Marshfield on the Roosevelt Coast Highway. Taken over from Coos county in May, 1928, and overhauled and plans made for an oil burning system to be used in place of the present wood burning system	b	5,000.00
	CROOK COUNTY		
1348	28′x48′ equipment shed at Prineville	a	2,985.42
	CURRY COUNTY		
1111	3-40′ R. C. spans, 2-160′ steel deck truss spans over Pistol River on Roosevelt Coast Highway	a	63,319.69
1112	2-19′ pile trestle spans over Crook Creek on Roosevelt Coast Highway near Pistol River and 116′ of pile trestle at Sta. 724	a	5,362.25
1161	203 lineal feet R. C. viaduct over Hunter's Creek at Station 112, Gold Beach-Hunter's Creek Section, Roosevelt Coast Highway	a	26,277.62
1228	3-30′ R. C. spans over Euchre Creek at Euchre Creek at Station 1047, Mussell Creek-Euchre Creek Section, Roosevelt Coast Highway	a	10,091.76
1307	Ferry slips and ferry over Rogue River on Roosevelt Coast Highway between Gold Beach and Wedderburn	a	45,606.65
1365	Bagnell's Ferry purchased for emergency use in case of failure of the Ferry Rogue	a	250.00
1379	15′x50′ R. C. slab and retaining wall on Roosevelt Coast Highway at Buffington's Cannery in Gold Beach	a	2,838.20

Key to Symbols in Third Column: a—construction completed; b—construction in progress; d—design completed, but construction not started.

TABLE No. 25—Continued

Bridge No.	Location and Type of Structure	Status Nov. 30, 1928	Estimated Cost
	DESCHUTES COUNTY		
1315	28′x72′ equipment shed at Bend	a	$ 4,292.15
1321	16′x24′ log building for caretaker's quarters at Lava River Caves Park, about 11 miles south of Bend on The Dalles-California Highway	a	2,862.29
1353	Range finders, monuments and other improvements in Pilot Butte Park at Bend	a	3,509.44
	DOUGLAS COUNTY		
983	6-19′ pile trestles, 1-18′ "I" beam retractable draw, 8-19′ pile trestle spans over Schofield River at Reedsport on Roosevelt Coast Highway	a	23,164.03
1276	71′ steel pony truss span with 2″x6″ laminated deck over Canyon Creek on the Pacific Highway	a	6,982.40
1277	71′ steel pony truss span with concrete deck over Canyon Creek on the Pacific Highway	a	7,622.91
1322	2-50′ R. C. spans over Deer Creek on Pacific Highway in the city of Roseburg	a	32,000.00
	HOOD RIVER COUNTY		
1320	22′x14′ frame building comfort station at Viento Park on Columbia River Highway	a	3,779.61
1383	9-29′ log spans over White River on the Mt. Hood Loop Highway near Government Camp	a	15,840.69
	JACKSON COUNTY		
576	2-50′ R. C. spans, 1-52′-6″ R. C. span, 1-143′ R. C. arch span, 1-52′-6″ R. C. span, 2-50′ R. C. spans over Rogue River at Gold Hill on the Pacific Highway	a	55,520.12
1349	1-16′, 1-44′, 1-16′ continuous R. C. spans over Footes Creek near Gold Hill on the Pacific Highway	a	9,263.90
	JOSEPHINE COUNTY		
1194	40′ R. C. span over Clear Creek at Station 1185, George Ranch-Hayes Hill Section, Redwood Highway	a	4,755.74
1201	20′ R. C. span over Clear Creek at Station 1245, George Ranch-Hayes Hill Section, Redwood Highway	a	4,374.49
1268	30′ R. C. span over Waters Creek at Station 1567, Applegate River-Hayes Hill Section, Redwood Highway	a	4,172.62
1269	30′ R. C. span over Slate Creek at Station 1498, Applegate River-Hayes Hill Section, Redwood Highway	a	3,147.71
1270	35′ R. C. span over Slate Creek at Station 1492, Applegate River-Hayes Hill Section, Redwood Highway	a	3,544.95
1271	35′ R. C. span over Butcherknife Creek at Station 1489, Applegate River-Hayes Hill Section, Redwood Highway	a	4,910.50
	LANE COUNTY		
1223	3-50′ R. C. spans, 1-550′ steel truss continuous over 4 supports, 4-50′ & 1-40′ R. C. span Willamette River at Springfield on the McKenzie River Highway	a	130,000.00
1323	1-20′, 3-60′, 1-20′ continuous R. C. spans over Blue River on the McKenzie River Highway at Blue River	a	19,000.00
1331	2-100′ steel pony truss spans on R. C. abutments over Deadwood Creek on the Siuslaw Highway near Swisshome	a	32,986.97
1369	3-60′ R. C. spans over the Eugene Power Canal on the McKenzie River Highway near Leaburg. Designed by the Highway Commission, but constructed by the Eugene Water Board without expense to the State	a	22,500.00
	LINCOLN COUNTY		
1089	4-20′, 1-23′-6″ R. C. spans, 1-160′ R. C. arch, 1-23′-6″, 4-20′ R. C. spans over Rocky Creek on the Otter Crest-Rocky Creek Section of the Roosevelt Coast Highway	a	59,000.00
1138	3-41′ R. C. spans, 1-150′ R. C. arch, 1-21′ R. C. span over DePoe Bay on the Otter Crest-Rocky Creek Section of the Roosevelt Coast Highway	a	55,557.09
1139	22-19′ trestle spans on concrete piling, 1-237′-9″ steel draw span, 3-19′ frame trestle spans over the Siletz River near Kernville on the Roosevelt Coast Highway	a	119,977.65
1173	1-23′ frame trestle, 1-140′ steel span, 2-23′ trestle spans on concrete piling over Yachats River on the Lane Co. Line-Yachats Section, Roosevelt Coast Highway	a	23,034.42

Key to Symbols in Third Column: a—construction completed; b—construction in progress; d—design completed, but construction not started.

TABLE No. 25—Continued

Bridge No.	Location and Type of Structure	Status Nov. 30, 1928	Estimated Cost
	LINN COUNTY		
1330	3-19′ frame trestle spans, 1-100′ steel deck truss span, 3-19′ pile trestle spans over Wiley Creek in Foster on the Santiam Highway	a	$ 16,727.73
	MARION COUNTY		
123	Placing concrete deck on steel portion of Willamette Bridge over Willamette River on the Salem-Dallas Highway	a	25,706.05
1340	193′ R. C. viaduct over South Mill Creek in Salem on the Pacific Highway. Designed by the Highway Commission for the city of Salem. Bridge constructed by the city of Salem without cost to the State. City of Salem reimbursed the Highway Commission for the cost of designing	a	43,925.36
	POLK COUNTY		
615	2-40′ R. C. spans, 1-100′ steel span, 3-40′ R. C. spans over Luckiamute River south of Monmouth on the Westside-Pacific Highway	a	39,000.00
1344	1-22′ R. C. span, 1-100′ steel pony span, 1-22′ R. C. span over Yamhill River 6 miles west of Willamina on the McMinnville-Tillamook Highway (Valley Junction Bridge)	a	18,584.87
	SHERMAN COUNTY		
108	2-127′ steel spans and 2-40′ concrete spans replacing existing timber construction on bridge over John Day River between Sherman and Gilliam counties on the Columbia River Highway	a	50,363.46
	TILLAMOOK COUNTY		
1216	5-19′ pile trestle spans, 1-120′ steel pony truss span, 8-19′ pile trestle spans over Trask River, 1¾ miles south of Tillamook on the Roosevelt Coast Highway	d	23,000.00
1217	1-50′ R. C. span, 2-100′ steel pony truss spans, 1-50′ R. C. span over the South Fork of the Nehalem River near Mohler on the Roosevelt Coast Highway	a	51,936.51
1226	1-20′ R. C. span, 1-100′ steel pony truss span, 1-20′ R. C. span over the Miami River near Garibaldi on the Roosevelt Coast Highway	a	22,622.04
1371	7-19′ pile trestle spans near Mohler on the Roosevelt Coast Highway	a	3,609.89
	UMATILLA COUNTY		
1140	Two-story Log Park Building and accessory equipment in Emigrant Springs Park near Meacham on the Old Oregon Trail Highway	a	25,655.43
1163	Patrolman's House and Equipment shed at Etna near Meacham on the Old Oregon Trail Highway	a	13,902.90
	UNION COUNTY		
1354	Shop and Office Buildings at La Grande	a	45,000.00
	WASCO COUNTY		
966	1-200′ steel span and 625 lin. ft. of R. C. viaduct approach over the Deschutes River at Maupin on The Dalles-California Highway	b	109,000.00
	YAMHILL COUNTY		
1396	1-18′, 1-45′, 1-18′ continuous R. C. spans over Agency Creek near Grande Ronde on the McMinnville-Tillamook Highway	b	7,300.00

Key to Symbols in Third Column: a—construction completed; b—construction in progress; d—design completed, but construction not started.

TABLE No. 26

BRIDGE DESIGNS PREPARED FOR COUNTIES

December 1, 1926, to November 30, 1928

Designs for the following bridges, constructed or to be constructed on county roads, have been prepared by the Highway Department, at the request of county road officials. In most cases the Highway Department has also supervised and engineered the construction work.

For the status of each structure as of November 30, 1928, refer to the third column and to the key to symbols given at the bottom of the page.

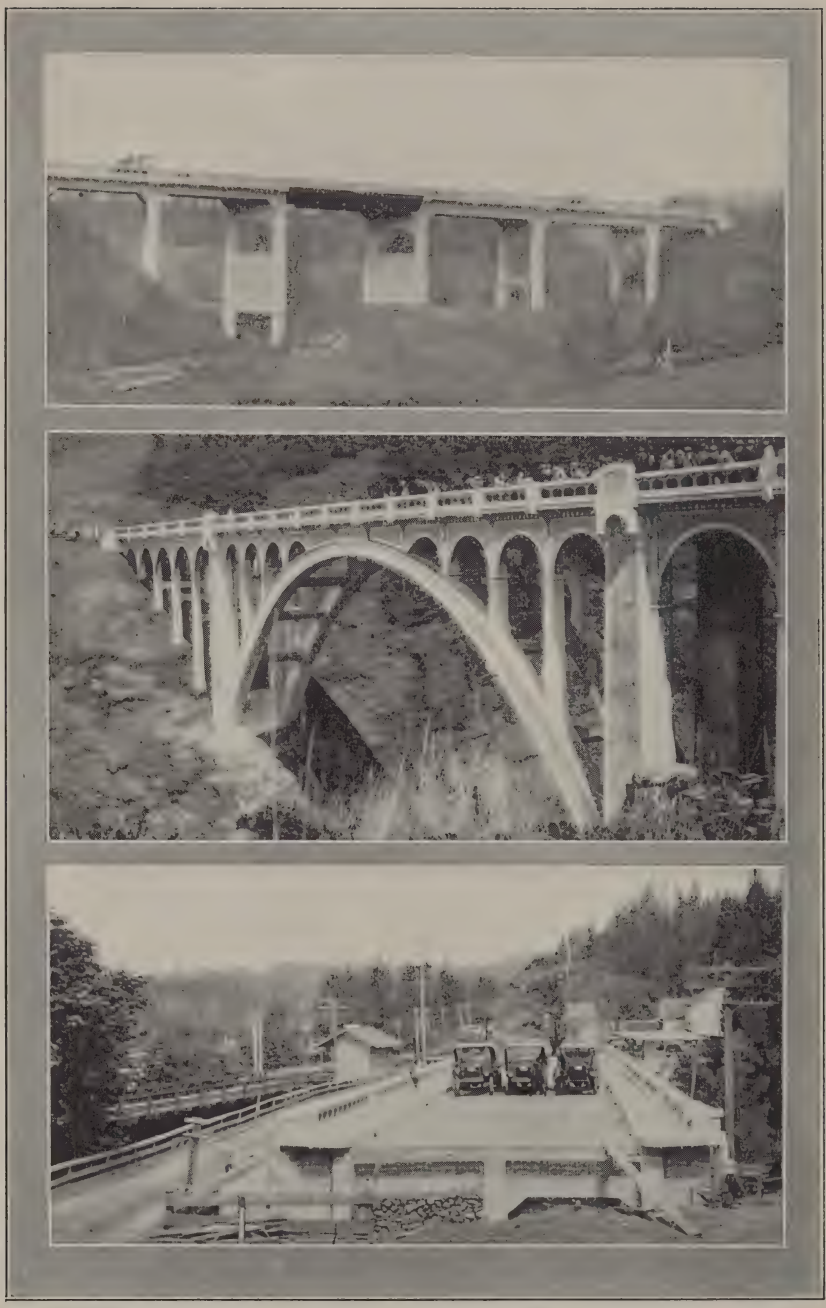
Bridge No.	Location and Type of Structure	Status Nov. 30, 1928
	BAKER COUNTY	
1190	1-320′ steel span, 1-120′ steel span, 2-19′ frame trestle spans over Snake River on county road at Ballard's Landing	a
1397	1-75′ steel span and 1-19′, 2-23′, 1-15′ and 1-24′ frame trestle spans over Powder River on the Baker-Medical Springs Market Road. (Truss to be reconstructed from old unused county truss)	d
	CLACKAMAS COUNTY	
1208	9-19′ pile trestle spans, 1-80′ steel span and 4-19′ pile trestle spans over Milk Creek on Market Road No. 25 near Mulino	a
1352	2-19′ pile trestle spans, 2-120′ steel spans and 11-19′ pile trestle spans over Molalla River near Liberal on Market Road No. 25. Wright's Bridge	a
	COLUMBIA COUNTY	
1325	1-90′ Howe truss over navigable slough near Woodson	a
1327	1-100′ steel span and 5-19′ frame trestle spans over Nehalem River five miles from Vernonia on Nehalem Market Road No. 4	a
1339	1-50′ draw span and 6-20′ pile trestle spans on the Magruder Road	a
1351	1-50′ draw span and 13-16′ pile trestle spans over Westport Slough near Marshland	a
1370	100′ steel pony truss span and 5-19′ frame trestle spans over Nehalem River five miles from Vernonia on Market Road No. 4	a
	DESCHUTES COUNTY	
1249	5-23′ pile trestle spans over Deschutes River near Tumalo at Sta. No. 9 of Nichols Market Road	a
	DOUGLAS COUNTY	
1311	Esther Wells Smith Bridge, 9-19′ trestle spans. 1-450′ continuous steel span and 5-19′ trestle spans over Umpqua River, about 20 miles from Drain, on Market Road No. 10	b
1316	79 lin. ft. of pile trestle over Windy Creek, near Glendale, on Glendale-Pacific Highway Market Road	a
1318	2-30′ concrete spans, 1-632′ continuous steel span and 4-30′ concrete spans over Umpqua River at Scottsburg, on the Drain-Reedsport Road	b
	JACKSON COUNTY	
930	Farlow Bridge. 1-40′ "A" frame span and 2-19′ frame trestle spans over North Fork of Little Butte Creek, on North Fork Little Butte Creek Market Road	a
	JOSEPHINE COUNTY	
1332	3-23′ frame trestle spans, 1-160′ steel span and 3-23′ frame trestle spans over the Applegate River, on the Wilderville-New Hope County Road	a
1337	1-45′ "A" frame with 46 lin. ft. of frame trestle approach over West Fork of Williams Creek	a
1338	1-21′ and 4-23′ frame trestle spans over Shan Creek, near Grants Pass on county road	a
	KLAMATH COUNTY	
1254	Fremont Bridge. 6-50′ R. C. spans over Link River near Klamath Falls on the Rock Creek Market Road	a

Key to Symbols in Third Column: a—construction completed; b—construction in progress; d—design completed, but construction not started.

TABLE No. 26—Continued

Bridge No.	Location and Type of Structure	Status Nov. 30, 1928
	LAKE COUNTY	
1384	1-23′ frame trestle span, 1-45′ "A" frame span and 1-23′ frame trestle span over Deep Creek, near Adel, on the Lakeview-Adel Market Road	d
	LANE COUNTY	
1229	Hayden Bridge. 7-19′ frame trestle spans, 1-180′ steel span and 2-19′ frame trestle spans over the McKenzie River, on Market Road No. 20	a
1336	Armitage Bridge. 5-19′ pile trestle spans, 2-170′ steel spans and 4-19′ pile trestle spans over the McKenzie River, near Coburg, on Market Road No. 41	a
1393	1-19′ pile trestle span, 1-268′ steel span and 7-19′ pile trestle spans over Coast Fork of the Willamette River, on Creswell East Market Road (Old Springfield Bridge revised)	b
	LINN COUNTY	
1191	Shindler Bridge. 1-100′ steel span and 4-21′ frame trestle spans over Thomas Creek, on Market Road No. 20	a
1356	1-120′ Howe truss over the Santiam River, near Cascadia, on county road	a
1387	3-19′ pile trestle spans near Griggs Station on Market Road No. 24	a
1388	5-19′ pile trestle spans over One Horse Swale on Market Road No. 20	a
1389	3-19′ pile trestle spans over Beaver Creek on Market Road No. 20	a
	MARION COUNTY	
1326	31-23′ pile trestle spans and repairs to old steel bridge over the Willamette River near Newberg on the county line between Marion and Yamhill counties	a
1329	Howell Prairie Bridge. 276 lin. ft. of pile trestle over the Powder River on the Silverton-Howell Prairie Market Road	a
1380	7′ x 7′ R. C. box culvert under 18′ fill near Mt. Angel on Market Road No. 49	a
1395	20′ R. C. span with 2-5′ sidewalks over mill race at Turner on Market Road No. 41	a
	POLK COUNTY	
1250	1-40′ "I" beam span and 2-19′ pile trestle spans over Pedee Creek near Pedee on Kings Valley Market Road	a
1251	1-75′ Howe truss over Ritner Creek on Kings Valley Market Road	a
	TILLAMOOK COUNTY	
1345	10-19′ pile trestle, 1-160′ steel and 10-19′ pile trestle spans over Tillamook River on Tillamook-Bay Ocean Road	b
1355	12-15′ frame trestle, 1-120′ steel and 8-15′ frame trestle spans over Trask River on Market Road No. 13	b
1358	1-48′ and 1-60′ timber deck truss over slough near Neah-kah-nie	a
1372	4-19′ pile trestle, 1-120′ steel and 5-19′ pile trestle spans over Big Nestucca River near Woods on county road	d
	UMATILLA COUNTY	
1350	1-80′ steel pony truss over Walla Walla River near Milton on Market Road No. 3	a
1360	1-130′ steel truss on R. C. abutments over the Umatilla River near Yokum on Market Road No. 42	a
	UNION COUNTY	
1368	Miller Bridge. 1-70′ steel span on concrete abutments over Catherine Creek near Hot Lake on county road	a
	WALLOWA COUNTY	
1317	1-30′ "A" frame over Hurricane Creek on Enterprise-Hurricane Creek Market Road	a
1382	1-24′ R. C. deck girder span on the Wallowa-Evans Market Road	d
	WASHINGTON COUNTY	
1335	1-13′ pile trestle, 1-80′ steel and 1-13′ pile trestle span over the Tualatin River near Cornelius on the Masonic Home-Snyder Ranch Market Road	a

Key to Symbols in Third Column: a—construction completed; b—construction in progress; d—design completed, but construction not started.



TOP—OVERCROSSING ON THE CORVALLIS-NEWPORT HIGHWAY AT WREN; CENTER—THE BEN F. JONES BRIDGE OVER ROCKY CREEK NEAR NEWPORT ON THE DAY OF ITS OPENING; BOTTOM—PARROTT CREEK BRIDGE ON PACIFIC HIGHWAY AT NEW ERA (Note Width of Roadway)

TABLE No. 27—Continued

APPORTIONMENT OF STATE MARKET ROAD FUNDS
1920 to 1928, Inclusive

County	1920-1924	1925	1926	1927	1928	1920-1928
Baker	$ 159,440.02	$ 31,505.98	$ 31,397.19	$ 32,299.09	$ 32,105.93	$ 286,748.21
Benton	92,761.61	21,597.15	21,989.00	22,665.49	22,812.81	181,826.06
Clackamas	244,932.95	65,013.87	67,658.56	70,000.00	71,162.12	518,767.50
Clatsop	209,940.96	41,247.92	40,206.99	40,199.39	37,722.55	369,317.81
Columbia	127,863.71	23,705.48	21,428.65	20,537.12	25,359.41	218,894.37
Coos	153,798.27	34,331.15	35,849.64	37,045.39	37,714.72	298,739.17
Crook	43,288.62	8,131.85	7,852.40	8,076.34	7,801.21	75,150.42
Curry	26,809.50	5,935.23	5,941.23	6,000.51	5,909.67	50,596.14
Deschutes	69,519.33	15,052.28	17,003.86	17,723.05	17,575.44	136,873.96
Douglas	185,898.40	41,832.54	42,512.04	45,166.18	44,525.49	359,934.65
Gilliam	76,915.84	13,841.58	13,717.21	13,827.49	13,223.50	131,525.62
Grant	58,091.62	10,562.20	10,357.22	10,497.10	10,161.32	99,669.46
Harney	76,533.67	12,263.95	11,800.00	12,215.47	11,827.18	124,640.27
Hood River	71,391.81	14,036.85	13,931.69	14,302.22	14,076.02	127,738.59
Jackson	198,016.79	40,010.30	40,391.34	42,294.68	42,301.72	363,014.83
Jefferson	39,179.00	7,614.36	7,444.83	7,518.95	7,396.89	69,154.03
Josephine	55,761.28	10,932.27	10,870.39	11,216.04	11,087.50	99,867.48
Klamath	122,147.49	29,153.36	32,359.44	37,104.53	42,069.79	262,834.61
Lake	73,617.51	14,673.97	14,143.24	14,219.17	14,014.91	130,668.80
Lane	279,784.61	59,858.47	63,501.64	68,756.00	73,000.35	544,901.07
Lincoln	54,254.05	12,319.15	12,096.54	12,437.23	12,134.34	103,241.31
Linn	221,895.46	46,941.73	45,641.16	46,474.36	46,344.94	407,297.65
Malheur	112,756.92	20,729.54	19,330.32	18,610.27	17,420.29	188,847.34
Marion	303,099.72	64,614.57	64,958.05	68,224.95	68,999.46	569,896.75
Morrow	78,622.41	15,181.36	15,002.58	15,393.87	15,252.95	139,453.17
Multnomah	511,965.81	103,957.15	105,631.56	110,181.75	112,441.65	944,177.92
Polk	128,337.75	26,471.89	26,226.99	27,119.77	26,494.01	234,650.41
Sherman	83,056.59	14,242.41	13,879.60	14,233.44	13,768.86	139,180.90
Tillamook	127,957.93	29,665.85	30,116.53	29,500.00	30,990.12	248,230.43
Umatilla	326,583.47	65,126.68	64,420.86	65,699.57	65,149.01	586,979.59
Union	147,342.86	26,530.06	26,359.68	27,541.02	27,858.99	255,632.61
Wallowa	92,749.99	12,867.53	16,566.64	16,276.42	15,404.95	153,865.53
Wasco	123,289.73	24,782.81	24,775.29	25,046.45	26,616.25	224,510.53
Washington	214,140.19	46,610.07	47,666.15	49,911.71	49,925.84	408,253.96
Wheeler	34,014.65	6,658.81	6,527.98	6,442.49	6,335.94	59,979.87
Yamhill	152,270.66	32,974.52	32,336.26	29,980.41	32,958.45	280,520.30
Totals	$5,078,031.18	$1,050,974.89	$1,061,892.75	$1,094,737.92	$1,109,944.58	$9,395,581.32

TABLE No. 28
APPORTIONMENT OF STATE MARKET ROAD FUNDS—1927

County	Amount Paid into State Market Road Fund by County	County's Pro Rata Share of Surplus Funds	County's Pro Rata Share of All Funds	County Market Road Levy for 1927	Final Apportionment of State Funds		
					Total	Paid to County in Cash	Paid to County in Service and Supplies
Baker	$ 22,927.24	$ 9,371.85	$ 32,299.09	$ 32,999.51	$ 32,299.09	$ 32,299.09	$
Benton	16,088.91	6,576.58	22,665.49	25,087.52	22,665.49	22,665.49	
Clackamas	50,782.21	20,757.99	71,540.20	70,000.00	70,000.00	70,000.00	
Clatsop	28,535.20	11,664.19	40,199.39	45,000.00	40,199.39	40,199.39	
Columbia	17,880.65	7,308.98	25,189.63	20,537.12	20,537.12	20,537.12	
Coos	26,296.36	10,749.03	37,045.39	46,250.00	37,045.39	37,045.39	
Crook	5,732.92	2,343.42	8,076.34	10,000.00	8,076.34	8,024.72	51.62
Curry	4,259.41	1,741.10	6,000.51	6,600.00	6,000.51	6,000.51	
Deschutes	12,795.57	5,230.38	18,025.95	17,723.05	17,723.05	15,853.72	1,869.33
Douglas	32,060.83	13,105.35	45,166.18	51,987.81	45,166.18	44,617.42	548.76
Gilliam	9,815.33	4,012.16	13,827.49	14,920.88	13,827.49	13,827.49	
Grant	7,451.28	3,045.82	10,497.10	13,592.57	10,497.10	10,497.10	
Harney	8,671.05	3,544.42	12,215.47	13,000.00	12,215.47	12,199.77	15.70
Hood River	10,152.51	4,149.91	14,302.22	15,000.00	14,302.22	14,302.22	
Jackson	30,022.52	12,272.16	42,294.68	44,764.75	42,294.68	42,294.68	
Jefferson	5,337.26	2,181.69	7,518.95	8,000.00	7,518.95	7,518.95	
Josephine	7,961.61	3,254.43	11,216.04	13,514.93	11,216.04	9,813.89	1,402.15
Klamath	26,338.34	10,766.19	37,104.53	43,000.00	37,104.53	37,104.53	
Lake	10,093.36	4,125.81	14,219.17	18,990.16	14,219.17	14,219.17	
Lane	49,001.18	20,029.97	69,031.15	68,756.00	68,756.00	68,756.00	
Lincoln	8,828.46	3,608.77	12,437.23	12,840.87	12,437.23	12,437.23	
Linn	32,989.43	13,484.93	46,474.36	48,170.17	46,474.36	46,474.36	
Malheur	13,210.34	5,399.93	18,610.27	20,500.00	18,610.27	18,610.27	
Marion	48,428.91	19,796.04	68,224.95	75,000.00	68,224.95	68,224.95	
Morrow	10,927.21	4,466.66	15,393.87	16,611.60	15,393.87	13,108.28	2,285.59
Multnomah	403,041.11		111,067.74	110,181.75	110,181.75	110,181.75	
Polk	19,250.74	7,869.03	27,119.77	27,183.88	27,119.77	27,119.77	
Sherman	10,103.49	4,129.95	14,233.44	25,771.00	14,233.44	14,233.44	
Tillamook	22,531.44	9,210.07	31,741.51	29,500.00	29,500.00	29,497.48	2.52
Umatilla	46,636.29	19,063.28	65,699.57	66,371.00	65,699.57	65,697.49	2.08
Union	19,549.76	7,991.26	27,541.02	40,000.00	27,541.02	27,541.02	
Wallowa	11,553.68	4,722.74	16,276.42	20,217.37	16,276.42	16,276.42	
Wasco	17,779.01	7,267.44	25,046.45	30,149.34	25,046.45	25,046.45	
Washington	35,429.41	14,482.30	49,911.71	55,055.78	49,911.71	49,902.29	9.42
Wheeler	4,573.15	1,869.34	6,442.49	10,129.34	6,442.49	4,762.43	1,680.06
Yamhill	23,641.38	9,663.77	33,305.15	29,980.41	29,980.41	29,980.41	
Totals	$1,110,677.35	$ 289,256.94	$1,107,960.92	$1,197,386.21	$1,094,737.92	$1,086,870.69	$ 7,867.23

TABLE No. 29
APPORTIONMENT OF STATE MARKET ROAD FUNDS—1928

County	Amount Paid into State Market Road Fund by County	County's Pro Rata Share of Surplus Funds	County's Pro Rata Share of All Funds	County Market Road Levy for 1928	Final Apportionment of State Funds		
					Total	Paid to County in Cash	Paid to County in Service and Supplies
Baker	$ 23,035.92	$ 9,070.01	$ 32,105.93	$ 34,867.41	$ 32,105.93	$ 32,105.93	$
Benton	16,368.13	6,444.68	22,812.81	25,000.00	22,812.81	22,812.81	
Clackamas	51,058.63	20,103.49	71,162.12	75,000.03	71,162.12	71,162.12	
Clatsop	27,065.83	10,656.72	37,722.55	45,000.00	37,722.55	37,722.55	
Columbia	18,195.31	7,164.10	25,359.41	25,359.41	25,359.41	25,359.41	
Coos	27,060.21	10,654.51	37,714.72	40,000.00	37,714.72	37,714.72	
Crook	5,597.35	2,203.86	7,801.21	10,000.00	7,801.21	7,794.37	6.84
Curry	4,240.17	1,669.50	5,909.67	6,600.00	5,909.67	5,909.67	
Deschutes	12,610.33	4,965.11	17,575.44	18,000.00	17,575.44	16,419.23	1,156.21
Douglas	31,946.92	12,578.57	44,525.49	50,998.67	44,525.49	42,756.29	1,769.20
Gilliam	9,487.83	3,735.67	13,223.50	13,944.68	13,223.50	13,223.50	
Grant	7,290.72	2,870.60	10,161.32	13,486.23	10,161.32	10,161.32	
Harney	8,485.97	3,341.21	11,827.18	14,000.00	11,827.18	6,864.45	4,962.73
Hood River	10,099.51	3,976.51	14,076.02	16,020.76	14,076.02	14,076.02	
Jackson	30,351.37	11,950.35	42,301.72	49,395.00	42,301.72	42,301.72	
Jefferson	5,307.25	2,089.64	7,396.89	8,000.00	7,396.89	7,396.89	
Josephine	7,955.25	3,132.25	11,087.50	13,500.00	11,087.50	11,087.50	
Klamath	30,184.96	11,884.83	42,069.79	43,000.00	42,069.79	42,069.79	
Lake	10,055.66	3,959.25	14,014.91	19,686.00	14,014.91	12,858.30	1,156.61
Lane	52,377.56	20,622.79	73,000.35	73,000.35	73,000.35	73,000.35	
Lincoln	8,706.36	3,427.98	12,134.34	13,502.99	12,134.34	12,134.34	
Linn	33,252.37	13,092.57	46,344.94	48,545.08	46,344.94	46,344.94	
Malheur	12,499.01	4,921.28	17,420.29	17,700.00	17,420.29	17,420.29	
Marion	49,506.93	19,492.53	68,999.46	99,278.69	68,999.46	68,999.46	
Morrow	10,943.95	4,309.00	15,252.95	16,633.99	15,252.95	15,252.95	
Multnomah	408,710.76		112,441.65	113,000.00	112,441.65	112,441.65	
Polk	19,009.38	7,484.63	26,494.01	27,456.60	26,494.01	26,494.01	
Sherman	9,879.12	3,889.74	13,768.86	25,771.00	13,768.86	13,768.86	
Tillamook	22,235.33	8,754.79	30,990.12	35,000.00	30,990.12	30,990.12	
Umatilla	46,744.24	18,404.77	65,149.01	66,000.00	65,149.01	65,149.01	
Union	19,988.75	7,870.24	27,858.99	65,000.00	27,858.99	27,858.99	
Wallowa	11,053.01	4,351.94	15,404.95	21,000.00	15,404.95	15,404.95	
Wasco	19,097.09	7,519.16	26,616.25	30,900.00	26,616.25	26,616.25	
Washington	35,821.66	14,104.18	49,925.84	55,673.30	49,925.84	49,916.09	9.75
Wheeler	4,546.02	1,789.92	6,335.94	9,966.10	6,335.94	3,722.58	2,613.36
Yamhill	23,647.60	9,310.85	32,958.45	33,013.36	32,958.45	32,958.45	
Totals	$1,124,416.46	$ 281,797.23	$1,109,944.58	$1,272,399.65	$1,109,944.58	$1,098,269.88	$ 11,674.70

TABLE No. 30

SUMMARY OF RECEIPTS AND EXPENDITURES BY COUNTIES IN CONNECTION WITH MARKET ROAD WORK—YEAR 1927

With the exception of amounts pertaining to state apportionments and state payments, the information given in this table is based upon information furnished by the officials of the respective counties.

County	County Market Road Tax Collected	State Market Road Funds Paid to County in Cash	Funds from Other Sources Expended on Market Roads	County's Income for Year for Market Roads	Balance Carried Forward from Previous Years	Total Cash Available	Balance on Hand at End of Year	Total Cash Expended by County	State Market Road Funds Paid to County in Form of Service and Supplies	Total Expended on Market Roads
Baker	$ 32,414.60	$ 32,299.09	$ 14,000.00	$ 78,713.69	$ 14,530.22	$ 93,243.91	$ 1,180.61	$ 92,063.30	$	$ 92,063.30
Benton	23,464.61	22,665.49	3.13	46,133.23	797.75	46,930.98	— 4,764.66	51,695.64	.....	51,695.64
Clackamas	70,000.00	70,000.00	173,237.41	313,237.41	— 18,285.74	294,951.67	5,670.12	289,281.55	.....	289,281.55
Clatsop	38,027.86	40,199.39	85,216.36	163,443.61	10,857.71	174,301.32	30,260.32	144,041.00	.....	144,041.00
Columbia	23,745.95	20,537.12	94,283.49	138,566.56	23,354.13	161,920.69	26,140.78	135,779.91	.....	135,779.91
Coos	36,250.00	37,045.39	224,051.77	297,347.16	— 42,187.74	255,159.42	— 20,872.87	276,032.29	.....	276,032.29
Crook	9,116.18	8,024.72	23.76	17,164.66	— 5,189.46	11,975.20	— 3,202.41	15,177.61	51.62	15,229.23
Curry	6,155.20	6,000.51	827.28	12,982.99	5,098.86	18,081.85	— 3,921.05	22,002.90	.....	22,002.90
Deschutes	15,732.14	15,853.72	59,413.11	90,998.97	6,233.01	97,231.98	— 191.16	97,423.14	1,869.33	99,292.47
Douglas	50,293.54	44,617.42	76,308.89	171,219.85	26,951.60	198,171.45	48,572.51	149,598.94	548.76	150,147.70
Gilliam	16,119.37	13,827.49	4.45	29,951.31	3,204.78	33,156.09	6,516.47	26,639.62	.....	26,639.62
Grant	13,561.28	10,497.10	.....	24,058.38	13,580.45	37,638.83	10,049.97	27,588.86	.....	27,588.86
Harney	12,076.44	12,199.77	5,951.00	30,227.21	12,790.00	43,017.21	5,591.47	37,425.74	15.70	37,441.44
Hood River	16,002.22	14,302.22	13.20	30,317.64	— 5,850.41	24,467.23	306.52	24,160.71	.....	24,160.71
Jackson	43,405.60	42,294.68	18,944.81	104,645.09	12,496.71	117,141.80	41,969.42	75,172.38	.....	75,172.38
Jefferson	7,579.92	7,518.95	3,000.00	18,098.87	619.00	18,717.87	786.50	17,931.37	.....	17,931.37
Josephine	13,514.93	9,813.89	.....	23,328.82	— 985.07	22,343.75	— 2,814.16	25,157.91	1,402.15	26,560.06
Klamath	42,163.42	37,104.53	26,500.00	105,767.95	6,877.19	112,645.14	13,901.18	98,743.96	.....	98,743.96
Lake	17,631.65	14,219.17	45.45	31,896.27	3,396.77	35,293.04	4,764.17	30,528.87	.....	30,528.87
Lane	66,732.00	68,756.00	18,678.75	154,166.75	204.20	154,370.95	4,806.22	149,564.73	.....	149,564.73
Lincoln	12,840.87	12,437.23	3,722.47	29,000.57	— 10,743.63	18,256.94	— .50	18,257.44	.....	18,257.44
Linn	49,966.33	46,474.36	7,040.81	103,481.50	— 35,876.28	67,605.22	2,407.71	65,197.51	.....	65,197.51
Malheur	20,441.13	18,610.27	.....	39,051.40	13,296.96	52,348.36	23,344.98	29,003.38	.....	29,003.38
Marion	75,000.00	68,224.95	200,219.87	343,444.82	.....	343,444.82	.....	343,444.82	.....	343,444.82
Morrow	18,141.11	13,108.28	89,212.87	120,462.26	12,850.37	133,312.63	14,273.90	119,038.73	2,285.59	121,324.32
Multnomah	110,181.75	110,181.75	.....	220,363.50	.....	220,363.50	.....	220,363.50	.....	220,363.50
Polk	26,017.75	27,119.77	6,022.51	59,160.03	— 18,127.94	41,032.09	4,727.20	36,304.89	.....	36,304.89
Sherman	25,771.00	14,233.44	26,000.00	66,004.44	— 10,330.71	55,673.73	— 21,102.17	76,775.90	.....	76,775.90
Tillamook	26,293.33	29,497.48	37,002.69	92,793.50	— 1,520.55	91,272.95	1,768.85	89,504.10	2.52	89,506.62
Umatilla	64,989.09	65,697.49	1,788.32	132,474.90	— 61,940.62	70,534.28	— 23,661.89	94,196.17	2.08	94,198.25
Union	38,453.32	27,541.02	165.87	66,160.21	— 4,091.95	62,068.26	— 29,492.10	91,560.36	.....	91,560.36
Wallowa	19,976.81	16,276.42	27,007.31	63,260.54	2,331.56	65,592.10	5,552.73	60,039.37	.....	60,039.37
Wasco	28,479.48	25,046.45	2,288.66	55,814.59	5,987.72	61,802.31	— 438.34	62,240.65	.....	62,240.65
Washington	55,829.86	49,902.29	88,180.94	193,913.09	2,256.59	196,169.68	— 48,186.87	244,356.55	9.42	244,365.97
Wheeler	9,413.70	4,762.43	.....	14,176.13	14,365.88	28,542.01	13,699.29	14,842.72	1,680.06	16,522.78
Yamhill	28,641.18	29,980.41	13,427.39	72,048.98	8,971.41	81,020.39	6,940.84	74,079.55	.....	74,079.55
Totals	$1,164,423.62	$1,086,870.69	$1,302,582.57	$3,553,876.88	$— 14,077.23	$3,539,799.65	$ 114,583.58	$3,425,216.07	$ 7,867.23	$3,433,083.30

TABLE No. 31

SUMMARY OF RECEIPTS AND EXPENDITURES BY COUNTIES IN CONNECTION WITH MARKET ROAD WORK—YEAR 1928

With the exception of amounts pertaining to state apportionments and state payments, the information given in this table is based upon information furnished by the officials of the respective counties.

County	County Market Road Tax Collected	State Market Road Funds Paid to County in Cash	Funds from Other Sources Expended on Market Roads	County's Income for Year for Market Roads	Balance Carried Forward from Previous Years	Total Cash Available	Balance on Hand at End of Year	Total Cash Expended by County	State Market Road Funds Paid to County in Form of Service and Supplies	Total Expended on Market Roads
Baker	$ 34,000.00	$ 32,105.93	$ 31,236.16	$ 97,342.09	$ 1,180.61	$ 98,522.70	$ 18,360.95	$ 80,161.75	$	$ 80,161.75
Benton	25,000.00	22,812.81	11,278.07	59,090.88	— 4,764.66	54,326.22	12,040.44	42,285.78		42,285.78
Clackamas	75,000.00	71,162.12	41,281.16	187,443.28	5,670.12	193,113.40	—15,412.77	208,526.17		208,526.17
Clatsop	44,000.00	37,722.55	47,283.79	129,006.34	30,260.32	159,266.66	24,892.43	134,374.23		134,374.23
Columbia	25,000.00	25,359.41	83,389.29	133,748.70	26,140.78	159,889.48	26,352.67	133,536.81		133,536.81
Coos	39,000.00	37,714.72	85,244.16	161,958.88	—20,872.87	141,086.01	—56,327.68	197,413.69		197,413.69
Crook	9,800.00	7,794.37		17,594.37	— 3,202.41	14,391.96	— 3,265.35	17,657.31	6.84	17,664.15
Curry	6,700.00	5,909.67	4,059.62	16,669.29	— 3,921.05	12,748.24	— 3,697.82	16,446.06		16,446.06
Deschutes	18,944.20	16,419.23		35,363.43	— 191.16	35,172.27	9,275.75	25,896.52	1,156.21	27,052.73
Douglas	50,000.00	42,756.29	49,206.01	141,962.30	48,572.51	190,534.81	6,273.47	184,261.34	1,769.20	186,030.54
Gilliam	13,000.00	13,223.50		26,223.50	6,516.47	32,739.97	13,148.85	19,591.12		19,591.12
Grant	13,000.00	10,161.32		23,161.32	10,049.97	33,211.29	2,315.52	30,895.77		30,895.77
Harney	14,000.00	6,864.45	51,802.44	72,666.89	5,591.47	78,258.36	25,799.77	52,458.59	4,962.73	57,421.32
Hood River	16,000.00	14,076.02		30,076.02	306.52	30,382.54	— 279.98	30,662.52		30,662.52
Jackson	49,000.00	42,301.72	143.34	91,445.06	41,969.42	133,414.48	63,897.14	69,517.34		69,517.34
Jefferson	7,500.00	7,396.89	5,522.23	20,419.12	786.50	21,205.62	2,477.15	18,728.47		18,728.47
Josephine	13,500.00	11,087.50		24,587.50	— 2,814.16	21,773.34	—20,791.05	42,564.39		42,564.39
Klamath	42,000.00	42,069.79	125,244.60	209,314.39	13,901.18	223,215.57	49,809.04	173,406.53		173,406.53
Lake	19,000.00	12,858.30	1,416.68	33,274.98	4,764.17	38,039.15	10,643.38	27,395.77	1,156.61	28,552.38
Lane	73,000.35	73,000.35	99,614.16	245,614.86	4,806.22	250,421.08	22,066.40	228,354.68		228,354.68
Lincoln	13,000.00	12,134.34	227.24	25,361.58	— .50	25,361.08	11,512.09	13,848.99		13,848.99
Linn	48,000.00	46,344.94	14,102.94	108,447.88	2,407.71	110,855.59	— 3,240.25	114,095.84		114,095.84
Malheur	17,000.00	17,420.29	690.85	35,111.14	23,344.98	58,456.12	35,819.08	22,637.04		22,637.04
Marion	99,278.69	68,999.46	257,988.00	426,266.15		426,266.15	94,278.69	331,987.46		331,987.46
Morrow	16,000.00	15,252.95	72,348.30	103,601.25	14,273.90	117,875.15	32,962.47	84,912.68		84,912.68
Multnomah	113,000.00	112,441.65		225,441.65		225,441.65		225,441.65		225,441.65
Polk	26,500.00	26,494.01	802.76	53,796.77	4,727.20	58,523.97	— 830.69	59,354.66		59,354.66
Sherman	25,771.00	13,768.86	12,361.87	51,901.73	—21,102.17	30,799.56	— 9,745.24	40,544.80		40,544.80
Tillamook	34,000.00	30,990.12	33,921.24	98,911.36	1,768.85	100,680.21	— 923.51	101,603.72		101,603.72
Umatilla	66,000.00	65,149.01	15,740.92	146,889.93	—23,661.89	123,228.04	—17,143.46	140,371.50		140,371.50
Union	46,000.00	27,858.99	42,084.16	115,943.15	—29,492.10	86,451.05	35,487.43	50,963.62		50,963.62
Wallowa	20,000.00	15,404.95	207.00	35,611.95	5,552.73	41,164.68	18,724.15	22,440.53		22,440.53
Wasco	29,000.00	26,616.25	2,267.33	57,883.58	— 438.34	57,445.24	— 331.92	57,777.16		57,777.16
Washington	55,000.00	49,916.09	56,168.66	161,084.75	—48,186.87	112,897.88	—37,060.00	149,957.88	9.75	149,967.63
Wheeler	8,000.00	3,722.58	16,000.00	27,722.58	13,699.29	41,421.87	5,712.96	35,708.91	2,613.36	38,322.27
Yamhill	32,500.00	32,958.45		65,458.45	6,940.84	72,399.29	22,275.15	50,124.14		50,124.14
Totals	$1,236,494.24	$1,098,269.88	$1,161,632.98	$3,496,397.10	$114,583.58	$3,610,980.68	$375,075.26	$3,235,905.42	$ 11,674.70	$3,247,580.12

TABLE No. 32
SUMMARY OF COUNTY MARKET ROAD RECEIPTS AND CLASSIFICATION OF EXPENDITURES, 1927-1928, INCLUSIVE

County	State Appropriation Funds Apportioned	County Market Road Levies Collected	Other County Funds Expended on Market Roads	Total Funds Available for Market Roads	Total Funds Expended on Market Roads	Classification of Expenditures				
						New Construction and Betterment	Maintenance	Cooperation on Forest Highways	Major Bridges	Cooperation on State Highways
Baker	$ 64,405.92	$ 66,414.60	$ 45,236.16	$ 176,055.78	$ 172,225.05	$ 90,158.02	$ 12,878.03	$	$	$ 69,189.00
Benton	45,478.30	48,464.61	11,281.20	105,224.11	93,981.42	69,609.37	6,106.05	.....	.....	18,266.00
Clackamas	141,162.12	145,000.00	214,518.57	500,680.69	497,807.72	465,058.10	32,749.62	.....	.....	.....
Clatsop	77,921.94	82,027.86	132,500.15	292,449.95	278,415.23	254,772.39	23,642.84	.....	.....	.....
Columbia	45,896.53	48,745.95	177,672.78	272,315.26	269,316.72	248,938.90	10,772.82	.....	9,605.00	.....
Coos	74,760.11	75,250.00	309,295.93	459,306.04	473,445.98	445,216.78	28,229.20	.....	.....	.....
Crook	15,877.55	18,916.18	23.76	34,817.49	32,893.38	24,278.82	8,614.56	.....	.....	.....
Curry	11,910.18	12,855.20	4,886.90	29,652.28	38,448.96	35,775.14	2,673.82	.....	.....	.....
Deschutes	35,298.49	34,676.34	59,413.11	129,387.94	126,345.20	119,916.96	6,428.24	.....	.....	.....
Douglas	89,691.67	100,293.54	125,514.90	315,500.11	336,178.24	208,320.25	34,536.99	.....	93,321.00	.....
Gilliam	27,050.99	29,119.37	4.45	56,174.81	46,230.74	45,035.86	1,194.88	.....	.....	.....
Grant	20,658.42	26,561.28	.....	47,219.70	58,484.63	26,110.08	3,331.55	.....	.....	29,043.00
Harney	24,042.65	26,076.44	57,753.44	107,872.53	94,862.76	55,778.67	3,748.09	16,714.00	.....	18,622.00
Hood River	28,378.24	32,002.22	13.20	60,393.66	54,823.23	51,500.20	3,323.03	.....	.....	.....
Jackson	84,596.40	92,405.60	19,088.15	196,090.15	144,689.72	137,015.20	7,674.52	.....	.....	.....
Jefferson	14,915.84	15,079.92	8,522.23	38,517.99	36,659.84	17,575.02	2,084.82	.....	.....	17,000.00
Josephine	22,303.54	27,014.93	.....	49,318.47	69,124.45	57,866.21	11,258.24	.....	.....	.....
Klamath	79,174.32	84,163.42	151,744.60	315,082.34	272,150.49	245,401.81	9,963.68	.....	.....	16,785.00
Lake	28,234.08	36,631.65	1,462.13	66,327.86	59,081.25	18,854.75	4,600.50	.....	.....	35,626.00
Lane	141,756.35	139,732.35	118,292.91	399,781.61	377,919.41	211,542.61	100,540.80	.....	65,836.00	.....
Lincoln	24,571.57	25,840.87	3,949.71	54,362.15	32,106.43	27,778.44	4,327.99	.....	.....	.....
Linn	92,819.30	97,966.33	21,143.75	211,929.38	179,293.35	164,167.07	15,126.28	.....	.....	.....
Malheur	36,030.56	37,441.13	690.85	74,162.54	51,640.42	29,555.75	12,084.67	.....	.....	10,000.00
Marion	137,224.41	174,278.69	458,207.87	769,710.97	675,432.28	595,688.91	36,005.37	.....	43,738.00	.....
Morrow	30,646.82	34,141.11	161,561.17	226,349.10	206,237.00	196,625.17	2,418.83	7,193.00	.....	.....
Multnomah	222,623.40	223,181.75	.....	445,805.15	445,805.15	445,805.15	.....	.....	.....	.....
Polk	53,613.78	52,517.75	6,825.27	112,956.80	95,659.55	81,172.07	8,487.48	.....	6,000.00	.....
Sherman	28,002.30	51,542.00	38,361.87	117,906.17	117,320.70	112,101.53	5,219.17	.....	.....	.....
Tillamook	60,490.12	60,293.33	70,923.93	191,707.38	191,110.34	157,907.50	9,494.84	.....	23,708.00	.....
Umatilla	130,848.58	130,989.09	17,529.24	279,366.91	234,569.75	197,955.17	21,614.58	.....	15,000.00	.....
Union	55,400.91	84,453.32	42,250.03	182,103.36	142,523.98	129,475.76	13,048.22	.....	.....	.....
Wallowa	31,681.37	39,976.81	27,214.31	98,872.49	82,479.90	62,777.77	2,921.13	.....	.....	16,781.00
Wasco	51,662.70	57,479.48	4,555.99	113,698.17	120,017.81	115,706.10	4,311.71	.....	.....	.....
Washington	99,837.55	110,829.86	144,349.60	355,017.01	394,333.60	365,208.31	29,125.29	.....	.....	.....
Wheeler	12,778.43	17,413.70	16,000.00	46,192.13	54,845.05	34,293.30	928.75	19,623.00	.....	.....
Yamhill	62,938.86	61,141.18	13,427.39	137,507.43	124,203.69	108,065.85	16,137.84	.....	.....	.....
Totals	$2,204,682.50	$2,400,917.86	$2,464,215.55	$7,069,815.91	$6,680,663.42	$5,653,008.99	$495,604.43	$ 43,530.00	$257,208.00	$ 231,312.00

TABLE No. 33
SUMMARY OF COUNTY MARKET ROAD RECEIPTS AND CLASSIFICATION OF EXPENDITURES 1920-1928, INCLUSIVE

County	State Appropriation Funds Apportioned	County Market Road Levies Collected	Other County Funds Expended on Market Roads	Total Funds Available for Market Roads	Total Funds Expended on Market Roads	Classification of Expenditures				
						New Construction and Betterment*	Maintenance	Cooperation on Forest Highways	Major Bridges	Cooperation on State Highways
Baker	$ 286,748.21	$ 282,617.83	$ 111,223.92	$ 680,589.96	$ 662,229.01	$ 517,370.30	$ 19,839.71	$	$ 13,500.00	$ 111,519.00
Benton	181,826.06	179,169.13	18,146.46	379,141.65	367,101.21	229,202.00	7,389.21			130,510.00
Clackamas	518,767.50	515,818.84	1,178,141.63	2,212,727.97	2,228,140.74	2,176,603.19	43,492.55			8,045.00
Clatsop	369,317.81	357,534.29	236,826.09	963,678.19	938,785.76	913,759.95	25,025.81			
Columbia	218,894.37	269,938.98	272,193.57	761,026.92	734,674.25	712,055.10	13,014.15		9,605.00	
Coos	298,739.17	350,792.63	506,862.58	1,156,394.38	1,212,722.06	1,124,009.33	46,422.73			42,290.00
Crook	75,150.42	83,245.11	13,262.57	171,658.10	174,923.45	162,997.08	11,926.37			
Curry	50,596.14	50,861.84	10,489.06	111,947.04	115,644.86	111,975.56	3,669.30			
Deschutes	136,873.96	121,806.61	77,633.17	336,313.74	327,037.99	292,129.75	9,488.24			25,420.00
Douglas	359,934.65	380,644.94	229,488.96	970,068.55	963,795.08	646,806.58	38,130.50	125,009.00	151,700.00	2,149.00
Gilliam	131,525.62	139,315.39	9,020.89	279,861.90	266,713.05	256,869.60	2,475.45		7,368.00	
Grant	99,669.46	130,965.52	18,142.89	248,777.87	246,462.35	192,217.77	4,784.58			49,460.00
Harney	124,640.27	115,635.77	117,806.51	358,082.55	332,282.78	252,164.79	4,781.99	56,714.00		18,622.00
Hood River	127,738.59	146,087.64	2,700.50	276,526.73	276,806.71	271,941.64	4,865.07			
Jackson	363,014.83	402,459.59	53,762.76	819,237.18	755,340.04	743,628.23	11,711.81			
Jefferson	69,154.03	65,770.38	15,481.69	150,406.10	147,928.95	107,557.54	3,371.41			37,000.00
Josephine	99,867.48	150,820.34	317.00	251,004.82	271,795.87	257,363.01	14,432.86			
Klamath	262,834.61	313,610.10	168,646.94	745,091.65	695,282.61	657,220.46	21,277.15			16,785.00
Lake	130,668.80	135,833.73	49,010.89	315,513.42	304,870.04	192,178.40	6,187.64			106,504.00
Lane	544,901.07	515,428.55	238,370.41	1,298,700.03	1,276,633.63	891,600.33	165,425.30	34,891.00	81,820.00	102,897.00
Lincoln	103,241.31	109,421.21	23,396.28	236,058.80	224,546.71	217,135.54	7,411.17			
Linn	407,297.65	395,078.90	36,038.81	838,415.36	841,655.61	760,707.57	28,598.04			52,350.00
Malheur	188,847.34	174,223.60	1,901.98	364,972.92	329,153.84	248,365.61	16,645.23			64,143.00
Marion	569,896.75	628,492.77	819,751.04	2,018,140.56	1,923,861.87	1,809,650.33	44,514.54		69,697.00	
Morrow	139,453.17	142,744.89	386,549.18	668,747.24	635,784.77	475,742.94	2,848.83	82,193.00		75,000.00
Multnomah	944,177.92	923,789.79	138,246.46	2,006,214.17	2,006,214.17	2,006,214.17				
Polk	234,650.41	241,253.29	27,235.92	503,139.62	503,970.31	487,435.28	10,535.03		6,000.00	
Sherman	139,180.90	216,161.48	65,361.87	420,704.25	430,449.49	393,578.87	6,485.62			30,385.00
Tillamook	248,230.43	228,756.69	77,574.69	554,561.81	555,485.32	465,003.48	10,644.84		79,837.00	
Umatilla	586,979.59	572,214.43	70,248.57	1,229,442.59	1,246,586.05	1,015,963.34	34,528.71		59,708.00	136,386.00
Union	255,632.61	296,571.17	57,691.64	609,895.42	574,407.99	554,600.69	19,807.30			
Wallowa	153,865.53	157,184.01	98,995.31	410,044.85	391,320.70	312,085.31	4,358.39			74,877.00
Wasco	224,510.53	256,114.48	59,392.63	540,017.64	540,349.56	533,037.85	7,311.71			
Washington	408,253.96	436,834.55	269,369.36	1,114,457.87	1,151,517.87	1,117,931.33	33,586.54			
Wheeler	59,979.87	70,155.66	43,000.00	173,135.53	167,422.57	145,952.49	1,847.08	19,623.00		
Yamhill	280,520.30	294,203.20	17,477.27	592,200.77	569,925.62	547,472.06	22,453.56			
Totals	$9,395,581.32	$9,851,557.33	$5,519,759.50	$24,766,898.15	$24,391,822.89	$21,800,527.47	$709,288.42	$318,430.00	$479,235.00	$1,084,342.00

* Does not include expenditures for major bridge construction, these being given in a separate column.

TABLE No. 34

AMOUNTS OF SURPLUS MULTNOMAH COUNTY FUNDS APPORTIONED TO EACH COUNTY, 1920 to 1928, Inclusive

In this table are given the amounts that each county has received from the state market road fund in excess of the amounts contributed to the fund by the county.

County	1920-1924	1925	1926	1927	1928	Total
Baker	$ 44,107.97	$ 8,618.27	$ 8,546.75	$ 9,371.85	$ 9,070.01	$ 79,714.85
Benton	22,355.85	5,907.77	5,985.71	6,576.58	6,444.68	47,270.59
Clackamas	54,830.83	17,563.94	18,417.60	19,217.79	20,103.49	130,133.65
Clatsop	56,743.38	11,283.12	10,944.90	11,664.19	10,656.72	101,292.31
Columbia	50,294.44	6,484.49	3,586.02	2,656.47	7,164.10	70,185.52
Coos	36,012.30	9,391.08	9,758.77	10,749.03	10,654.51	76,565.69
Crook	13,022.99	2,224.42	2,137.53	2,343.42	2,203.86	21,932.22
Curry	7,242.50	1,623.55	1,617.29	1,741.10	1,669.50	13,893.94
Deschutes	14,655.91	2,902.64	4,444.63	4,927.48	4,965.11	31,895.77
Douglas	43,811.91	11,443.04	11,572.37	13,105.35	12,578.57	92,511.24
Gilliam	22,289.30	3,786.28	3,734.02	4,012.16	3,735.67	37,557.43
Grant	17,226.20	2,889.23	2,819.38	3,045.82	2,870.60	28,851.23
Harney	20,741.25	3,354.73	2,875.68	3,544.42	3,341.21	33,857.29
Hood River	21,015.30	3,839.70	3,792.40	4,149.91	3,976.51	36,773.82
Jackson	54,941.53	10,944.58	10,995.09	12,272.16	11,950.35	101,103.71
Jefferson	10,511.96	2,082.86	2,026.59	2,181.69	2,089.64	18,892.74
Josephine	16,135.49	2,990.46	2,959.07	3,254.43	3,132.25	28,471.70
Klamath	31,141.29	7,974.73	8,808.69	10,766.19	11,884.83	70,575.73
Lake	17,565.77	4,013.98	3,849.99	4,125.81	3,959.25	33,514.80
Lane	75,546.88	16,373.93	17,286.03	19,754.82	20,622.79	149,584.45
Lincoln	14,734.41	3,369.83	3,292.85	3,608.77	3,427.98	28,433.84
Linn	61,137.94	12,840.63	12,424.16	13,484.93	13,092.57	112,980.23
Malheur	30,973.40	5,670.44	5,261.98	5,399.93	4,921.28	52,227.03
Marion	86,108.97	17,674.93	17,682.49	19,796.04	19,492.53	160,754.96
Morrow	21,227.76	4,152.77	4,083.91	4,466.66	4,309.00	38,240.10
Multnomah	.....	.....	.....	.....	.....	.....
Polk	35,751.20	7,241.23	7,139.35	7,869.03	7,484.63	65,485.44
Sherman	23,620.82	3,895.93	3,778.22	4,129.95	3,889.74	39,314.66
Tillamook	37,845.08	8,114.92	7,861.03	6,968.56	8,754.79	69,544.38
Umatilla	89,519.60	17,815.02	17,536.26	19,063.28	18,404.77	162,338.93
Union	40,735.43	7,257.14	7,175.47	7,991.26	7,870.24	71,029.54
Wallowa	21,992.84	588.74	4,509.67	4,722.74	4,351.94	36,165.93
Wasco	35,513.98	6,779.19	6,744.18	7,267.44	7,519.16	63,823.95
Washington	58,282.25	12,749.91	12,975.39	14,482.30	14,104.18	112,644.03
Wheeler	8,020.64	1,821.48	1,777.01	1,869.34	1,789.92	15,278.39
Yamhill	33,531.10	9,019.98	8,802.38	6,339.08	9,310.85	67,003.34
Totals	$1,229,238.47	$254,684.94	$257,202.86	$276,919.93	$281,797.23	$2,299,843.43

TABLE No. 35

SUMMARY OF ADVANCES MADE TO COUNTIES IN THE FORM OF SERVICES, MATERIALS AND SUPPLIES FURNISHED FOR MARKET ROAD WORK—1920 to 1928, Inclusive

The amounts given in this table are the costs of the services, materials and supplies, furnished to the various counties by the State Highway Commission, at the request of the officials of the respective counties. The services furnished were principally engineering services in connection with market road surveys. Other major items were the rental of state-owned equipment and the furnishing of repair parts for county-owned equipment. For the services, materials and supplies thus furnished, the state received reimbursement by making deductions from the apportionments of state market road funds to the respective counties. The amounts are included in the preceding table of county expenditures.

County	1920-1924	1925	1926	1927	1928	Total
Baker	$ 2,139.62	$ 435.69	$ 4,275.94	$	$	$ 6,851.25
Benton	366.82	4.00	24.61			395.43
Clackamas	3,546.83	692.85	1,109.48			5,349.16
Clatsop	326.19		35.69			361.88
Columbia	40.52	37.44	128.52			206.48
Coos	24.31	4.00				28.31
Crook	6,911.01		19.90	51.62	6.84	6,989.37
Curry	4,197.19	1,622.85	1,100.42			6,920.46
Deschutes	3,660.66	3,492.04	603.95	1,869.33	1,156.21	10,782.19
Douglas	773.04	56.76	1,232.57	548.76	1,769.20	4,380.33
Gilliam	5,954.10	1,784.87	3,269.48			11,008.45
Grant	27.32	11.24				38.56
Harney	10,163.54	1,391.19	107.05	15.70	4,962.73	16,640.21
Hood River	1,601.67		4.57			1,606.24
Jackson	25,143.90	105.80				25,249.70
Jefferson	1,374.37	1,470.10				2,844.47
Josephine	7,875.17	447.24	952.26	1,402.15		10,676.82
Klamath	9,850.55	8.61	10.46			9,869.62
Lake	7,430.22	230.87	90.27		1,156.61	8,907.97
Lane	267.15					267.15
Lincoln	18.48		5.07			23.55
Linn	22.98	39.74				62.72
Malheur	12,108.24	7,477.68	403.26			19,989.18
Marion	4.17	256.00	390.42			650.59
Morrow	5,996.65	622.57	7,698.92	2,285.59		16,603.73
Multnomah						
Polk	5,122.20	4.00	140.43			5,266.63
Sherman	593.63					593.63
Tillamook	11.77	190.58	30.59	2.52		235.46
Umatilla	10.90		3,207.86	2.08		3,220.84
Union	5,193.44	238.89	3.47			5,435.80
Wallowa	232.46					232.46
Wasco	5.00	100.02				105.02
Washington	8,066.53	164.50	89.16	9.42	9.75	8,339.36
Wheeler	5,660.00	741.55	914.19	1,680.06	2,613.36	11,609.16
Yamhill	11,241.19	65.56	26.30			11,333.05
Totals	$145,961.82	$21,696.64	$25,874.84	$ 7,867.23	$11,674.70	$213,075.23

TABLE No. 36
SUMMARY OF EXPENDITURES MADE BY COUNTIES UNDER MARKET ROAD ACT 1920 TO 1928, INCLUSIVE

This table is compiled from information furnished by the officials of the respective counties. The amounts given include, in addition to the amounts expended directly by the counties, the cost of such services, materials, and supplies as have been furnished to the counties by the State Highway Commission at the specific request of the county officials.

County	1920-1924 Inclusive	1925	1926	1927	1928	1920-1928
Baker	$ 293,308.44	$ 83,581.80	$ 113,113.72	$ 92,063.30	$ 80,161.75	$ 662,229.01
Benton	182,909.12	41,087.72	49,122.95	51,695.64	42,285.78	367,101.21
Clackamas	473,775.74	674,022.02	582,535.26	289,281.55	208,526.17	2,228,140.74
Clatsop	414,121.63	86,514.96	159,733.94	144,041.00	134,374.23	938,785.76
Columbia	285,873.73	120,726.33	58,757.47	135,779.91	133,536.81	734,674.25
Coos	300,454.87	145,661.79	293,159.42	276,032.29	197,413.69	1,212,722.06
Crook	100,520.35	18,144.34	23,365.38	15,229.23	17,664.15	174,923.45
Curry	53,544.52	10,032.33	13,619.05	22,002.90	16,446.06	115,644.86
Deschutes	115,128.21	54,690.18	30,874.40	99,292.47	27,052.73	327,037.99
Douglas	392,984.07	140,898.67	93,734.10	150,147.70	186,030.54	963,795.08
Gilliam	163,631.73	31,739.92	25,110.66	26,639.62	19,591.12	266,713.05
Grant	131,279.26	21,333.74	35,364.72	27,588.86	30,895.77	246,462.35
Harney	114,779.51	44,795.67	77,844.84	37,441.44	57,421.32	332,282.78
Hood River	144,676.28	34,018.73	43,288.47	24,160.71	30,662.52	276,806.71
Jackson	474,908.04	98,112.27	37,630.01	75,172.38	69,517.34	755,340.04
Jefferson	73,651.38	17,094.13	20,523.60	17,931.37	18,728.47	147,928.95
Josephine	151,420.40	35,754.68	15,496.34	26,560.06	42,564.39	271,795.87
Klamath	276,051.34	81,484.58	65,596.20	98,743.96	173,406.53	695,282.61
Lake	161,712.37	38,490.63	45,585.79	30,528.87	28,552.38	304,870.04
Lane	550,375.59	122,328.75	226,009.88	149,564.73	228,354.68	1,276,633.63
Lincoln	113,923.39	34,293.77	44,223.12	18,257.44	13,848.99	224,546.71
Linn	412,467.33	152,903.67	96,991.26	65,197.51	114,095.84	841,655.61
Malheur	184,718.19	53,009.76	39,785.47	29,003.38	22,637.04	329,153.84
Marion	802,954.68	149,304.96	296,169.95	343,444.82	331,987.46	1,923,861.87
Morrow	181,249.85	28,464.47	219,833.45	121,324.32	84,912.68	635,784.77
Multnomah	1,107,505.95	241,639.95	211,263.12	220,363.50	225,441.65	2,006,214.17
Polk	288,727.78	57,986.38	61,596.60	36,304.89	59,354.66	503,970.31
Sherman	194,340.61	57,524.31	61,263.87	76,775.90	40,544.80	430,449.49
Tillamook	237,962.85	66,784.39	59,627.74	89,506.62	101,603.72	555,485.32
Umatilla	625,868.45	256,660.07	129,487.78	94,198.25	140,371.50	1,246,586.05
Union	292,121.31	67,450.59	72,312.11	91,560.36	50,963.62	574,407.99
Wallowa	229,336.21	34,429.45	45,075.14	60,039.37	22,440.53	391,320.70
Wasco	303,674.63	61,989.44	54,667.68	62,240.65	57,777.16	540,349.56
Washington	437,184.22	148,752.21	171,247.84	244,365.97	149,967.63	1,151,517.87
Wheeler	64,779.59	43,678.96	4,118.97	16,522.78	38,322.27	167,422.57
Yamhill	297,928.10	86,963.28	60,830.55	74,079.55	50,124.14	569,925.62
Totals	$10,629,849.72	$ 3,442,348.90	$ 3,638,960.85	$ 3,433,083.30	$ 3,247,580.12	$24,391,822.89

TABLE No. 37
EXPENDITURES FOR MAINTENANCE OF MARKET ROADS AND MILEAGES MAINTAINED
YEARS 1925-1928

The amounts given in this table are as reported by county officials. Expenditures for 1928 are to November 1, and are not for a complete year. Only those counties entered in 1925 column established market road maintenance organizations in 1925. In the other counties the market roads were maintained as county roads.

In all counties prior to 1925 the market roads were maintained as county roads.

County	Amounts Expended for Maintenance						Miles Maintained		
	1925	1926	1927	1928	1927-1928	1925-1928	1926	1927	1928
Baker	$ 3,553.56	$ 3,408.12	$ 6,444.57	$ 6,433.46	$ 12,878.03	$ 19,839.71	34.65	34.66	50.46
Benton		1,283.16	3,082.68	3,023.37	6,106.05	7,389.21	26.52	30.38	35.13
Clackamas		10,742.93	15,749.62	17,000.00	32,749.62	43,492.55	171.50	251.00	260.00
Clatsop		1,382.97	17,864.31	5,778.53	23,642.84	25,025.81	29.40	48.80	32.00
Columbia		2,241.33	3,241.49	7,531.33	10,772.82	13,014.15	20.33	32.83	57.30
Coos		18,193.53	16,588.68	11,640.52	28,229.20	46,422.73	149.00	150.70	158.00
Crook		3,311.81	3,218.98	5,395.58	8,614.56	11,926.37	51.00	58.50	74.00
Curry	247.00	748.48	1,819.17	854.65	2,673.82	3,669.30	10.30	12.51	9.60
Deschutes		3,060.00	3,360.00	3,068.24	6,428.24	9,488.24	43.33	47.73	107.80
Douglas		3,593.51	7,054.30	27,482.69	34,536.99	38,130.50	27.30	56.70	196.20
Gilliam		1,280.57	555.19	639.69	1,194.88	2,475.45	26.30	26.30	26.30
Grant		1,453.03	1,883.98	1,447.57	3,331.55	4,784.58	29.80	33.00	30.44
Harney		1,033.90	1,311.08	2,437.01	3,748.09	4,781.99	57.50	57.00	69.00
Hood River		1,542.04	1,364.59	1,958.44	3,323.03	4,865.07	9.10	10.90	15.80
Jackson	250.50	3,786.79	4,762.44	2,912.08	7,674.52	11,711.81	48.20	48.20	57.50
Jefferson	763.00	523.59	931.47	1,153.35	2,084.82	3,371.41	47.50	47.50	51.00
Josephine		3,174.62	6,390.59	4,867.65	11,258.24	14,432.86	35.60	36.30	40.80
Klamath	5,070.99	6,242.48	6,726.59	3,237.09	9,963.68	21,277.15	82.00	89.40	89.20
Lake		1,587.14	1,969.55	2,630.95	4,600.50	6,187.64	12.00	11.90	11.90
Lane	14,156.38	50,728.12	47,078.82	53,461.98	100,540.80	165,425.30	295.40	319.10	292.60
Lincoln	1,044.22	2,038.96	3,468.28	859.71	4,327.99	7,411.17	17.90	16.00	23.30
Linn	5,973.41	7,498.35	10,597.81	4,528.47	15,126.28	28,598.04	68.80	86.70	93.20
Malheur	621.95	3,938.61	9,484.50	2,600.17	12,084.67	16,645.23	63.50	65.00	74.60
Marion		8,509.17	22,573.58	13,431.79	36,005.37	44,514.54	162.65	195.75	242.50
Morrow		430.00	1,196.22	1,222.61	2,418.83	2,848.83	21.80	36.80	43.73
Multnomah									
Polk		2,047.55	4,220.34	4,267.14	8,487.48	10,535.03	21.30	42.30	46.35
Sherman		1,266.45	2,342.48	2,876.69	5,219.17	6,485.62	31.80	39.79	59.33
Tillamook		1,150.00	1,760.00	7,734.84	9,494.84	10,644.84	10.60	11.50	26.50
Umatilla	1,238.44	11,675.69	11,855.63	9,758.95	21,614.58	34,528.71	127.18	134.11	133.23
Union	1,848.69	4,910.39	6,446.22	6,602.00	13,048.22	19,807.30	72.19	78.54	84.03
Wallowa	725.70	711.56	1,591.25	1,329.88	2,921.13	4,358.39	26.30	37.52	45.32
Wasco		3,000.00	3,019.59	1,292.12	4,311.71	7,311.71	61.52	61.52	54.89
Washington	1,439.51	3,021.74	10,254.27	18,871.02	29,125.29	33,586.54	28.86	57.97	86.76
Wheeler		918.33	639.00	289.75	928.75	1,847.08	13.10	22.00	16.00
Yamhill	1,734.31	4,581.41	7,979.79	8,158.05	16,137.84	22,453.56	53.00	79.42	86.48
Totals	$ 38,667.66	$ 175,016.33	$ 248,827.06	$ 246,777.37	$ 495,604.43	$ 709,288.42	1,987.23	2,368.33	2,781.25

TABLE No. 38

MILEAGES OF MARKET ROAD CONSTRUCTION WORK ACCOMPLISHED UNDER MARKET ROAD ACT YEARS 1920 TO 1928, INCLUSIVE

County	1920-1924			1925-1926			1927-28			1920-1928		
	Grading	Rock or Gravel Surfacing	Paving	Grading	Rock or Gravel Surfacing	Paving	Grading	Rock or Gravel Surfacing	Paving	Grading	Rock or Gravel Surfacing	Paving
Baker	23.78	19.03	.....	16.90	15.15	.....	14.41	16.91	.....	55.09	51.09	.....
Benton	10.96	5.46	.....	9.89	7.08	.....	8.33	16.75	.....	29.18	29.29	.....
Clackamas	105.22	35.53	51.54	49.41	28.83	59.65	25.05	20.18	9.73	179.68	84.54	120.92
Clatsop	13.62	1.04	10.83	6.42	5.86	3.74	10.66	6.74	.....	30.70	13.64	14.57
Columbia	19.68	15.88	.....	8.08	11.15	.....	31.56	32.72	1.79	59.32	59.75	1.79
Coos	35.37	29.64	.....	31.19	35.85	.....	29.62	31.18	.....	96.18	96.67	.....
Crook	47.74	17.91	.....	7.48	8.23	.....	5.34	.....	.....	59.76	26.14	.....
Curry	6.95	6.19	.....	1.53	1.53	.....	6.48	3.43	.....	15.76	11.15	.....
Deschutes	24.83	2.92	.....	22.30	1.29	.....	77.10	.....	.....	124.23	4.21	.....
Douglas	58.49	77.82	.....	10.90	13.37	1.56	14.91	9.47	2.25	84.30	100.66	3.81
Gilliam	10.78	5.43	.....	7.45	9.81	.....	5.62	3.42	.....	23.85	18.66	.....
Grant	23.74	0.78	.....	5.09	2.55	.....	8.03	0.11	.....	36.86	3.44	.....
Harney	49.18	.....	.....	6.00	12.00	.....	7.00	9.50	.....	62.18	21.50	.....
Hood River	4.30	.....	4.30	6.41	6.41	.....	6.07	4.21	.....	16.78	10.62	4.30
Jackson	44.36	39.40	8.42	4.90	9.86	.....	14.83	14.23	.....	64.09	63.49	8.42
Jefferson	35.04	29.70	.....	8.46	3.22	.....	8.96	.....	.....	52.46	32.92	.....
Josephine	31.17	30.88	.....	5.12	5.41	.....	4.34	4.34	.....	40.63	40.63	.....
Klamath	39.49	24.95	.....	21.50	11.55	.....	11.60	41.39	.....	72.59	77.89	.....
Lake	11.92	5.75	.....	.....	3.36	.....	2.36	2.36	.....	14.28	11.47	.....
Lane	60.85	58.56	.....	31.46	41.10	.....	38.54	29.02	.....	130.85	128.68	.....
Lincoln	14.42	12.47	.....	11.60	8.75	.....	4.44	0.12	.....	30.46	21.34	.....
Linn	92.37	90.90	.....	33.16	31.90	.....	22.83	21.10	.....	148.36	143.90	.....
Malheur	29.47	18.77	.....	27.51	1.29	.....	13.31	8.48	.....	70.29	28.54	.....
Marion	58.43	.....	58.43	42.36	24.43	19.19	87.75	86.63	13.71	188.54	111.06	91.33
Morrow	18.05	15.69	.....	17.96	11.09	.....	24.87	30.24	.....	60.88	57.02	.....
Multnomah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Polk	36.21	36.48	1.75	18.99	22.71	.....	13.13	12.30	.....	68.33	71.49	1.75
Sherman	22.46	20.46	.....	13.89	15.91	.....	20.92	20.92	.....	57.27	57.29	.....
Tillamook	8.20	4.21	1.06	4.78	5.95	.....	10.99	14.97	.....	23.97	25.13	1.06
Umatilla	98.04	89.30	.....	28.07	26.48	.....	13.10	21.20	.....	139.21	136.98	.....
Union	45.19	25.22	.....	20.16	12.62	.....	13.98	16.84	.....	79.33	54.68	.....
Wallowa	26.93	20.13	.....	3.35	3.35	.....	17.77	14.77	.....	48.05	38.25	.....
Wasco	35.22	35.22	.....	16.69	15.69	.....	21.31	20.17	.....	73.22	71.08	.....
Washington	48.64	96.86	0.44	44.25	41.99	.....	45.90	45.61	.....	138.79	184.46	0.44
Wheeler	9.43	9.57	.....	1.92	4.68	.....	2.69	.....	.....	14.04	14.25	.....
Yamhill	43.74	41.15	.....	23.13	23.74	0.53	20.68	23.17	.....	87.55	88.06	0.53
Totals	1,244.27	923.30	136.77	568.31	484.19	84.67	664.48	582.48	27.48	2,477.06	1,989.97	248.92

TABLE No. 39

MILEAGES IN COUNTY MARKET ROAD SYSTEMS

The mileages given in this table are included also in the table of county road mileages given on page 149.

County	Total Mileage	Miles of Different Types of Improvement				
		Paved With Bituminous Pavement	Paved With Concrete Pavement	Surfaced With Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
Baker	106.70	.....	.....	52.86	.....	53.84
Benton	35.13	.....	.....	35.13	.....	.....
Clackamas	293.75	68.50	70.75	71.50	30.50	52.50
Clatsop	87.90	5.00	26.40	17.60	13.60	25.30
Columbia	111.83	.....	1.40	57.53	1.00	51.90
Coos	188.00	.....	.....	140.50	16.50	31.00
Crook	97.00	.....	.....	43.00	20.00	34.00
Curry	68.85	.....	.....	13.03	2.59	53.23
Deschutes	195.42	0.14	.....	2.92	110.74	81.62
Douglas	270.00	0.40	6.25	193.75	32.20	37.40
Gilliam	141.80	.....	.....	26.10	5.70	110.00
Grant	99.40	.....	.....	25.50	30.90	43.00
Harney	116.70	.....	.....	47.50	42.70	26.50
Hood River	35.80	.....	4.20	22.30	3.00	6.30
Jackson	123.50	8.40	.....	60.20	24.90	30.00
Jefferson	108.95	.....	.....	25.36	20.66	62.93
Josephine	50.40	.....	.....	40.80	.....	9.60
Klamath	118.27	.....	.....	87.15	13.32	17.80
Lake	93.00	.....	.....	11.40	3.00	78.60
Lane	436.10	.....	.....	347.50	18.80	69.89
Lincoln	49.30	.....	.....	23.80	8.80	16.70
Linn	296.40	.....	.....	214.00	0.00	82.40
Malheur	76.50	.....	.....	32.00	16.00	28.50
Marion	279.26	159.70	.....	116.57	.....	2.99
Morrow	157.60	.....	.....	61.23	0.88	95.49
Multnomah	.....	.....	.....	.....	.....	.....
Polk	126.00	2.50	.....	96.60	13.30	13.60
Sherman	132.60	.....	.....	71.45	.....	61.15
Tillamook	115.90	.....	2.70	62.40	8.30	42.50
Umatilla	279.49	.....	.....	135.72	4.11	139.66
Union	169.17	.....	.....	79.13	17.50	72.54
Wallowa	234.38	.....	.....	40.38	19.73	174.27
Wasco	170.70	.....	.....	96.56	20.73	53.41
Washington	199.11	3.88	.....	102.63	1.36	91.24
Wheeler	69.00	.....	.....	11.30	8.60	49.10
Yamhill	145.14	0.50	7.00	105.08	4.43	28.13
Total	5,279.05	249.02	118.70	2,570.48	513.85	1,827.00

TABLE No. 40

LIST OF PARK SITES ACQUIRED FOR THE STATE BY THE STATE HIGHWAY COMMISSION

November 30, 1928

County	Name of Park	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration	Development
Baker	Unnamed	30.0	Baker-Unity Hwy. near Stices Gulch	N. ½ of SE. ¼ of SE. ¼ and the NW. ¼ of SW. ¼ of SE. ¼, Sec. 19, T. 11 S., R. 40 E., W. M.	U. S. Government	Exchange of school land scrip	$	Water supply
Baker	Unnamed	40.0	Old Oregon Trail at Rattlesnake Springs	SE. ¼ of NW. ¼ of Sec. 13, T. 12 S., R. 43 E., W. M.	U. S. Government	Exchange of school land scrip	.....	Water supply
Baker	Unnamed	77.31	Baker-Cornucopia Hwy., 3 miles E. of Middle Bridge	Lots 3 and 4 of Sec. 6, T. 9 S., R. 44 E., W. M.	U. S. Government	Purchase under Act of June 14, 1926	96.64	Water supply
Baker	Unnamed	1.06	Baker-Unity Hwy. on N. side of Dooley Mountain	In SW. ¼ of Sec. 20, T. 11 S., R. 40 E., W. M.	Ernst Hebestreit, Baker	Purchase	500.00	Water supply
Baker	Unnamed	60.27	John Day Hwy., 6 miles SE. of Unity	In E. ½ of Sec. 1 and NE. ¼ of Sec. 12, T. 14 S., R. 37 E., W. M.	C. J. Storzbach	Purchase	180.81	Water supply
Clackamas	Unnamed	0.388	Pacific Hwy. S. of Oregon City	In A. McKinley D. L. C. No. 60, T. 2 S., R. 2 E., W. M.	G. C. Fields and wife and Sunset Land Co., Oregon City	Purchase	2,000.00	Parking space
Clackamas	Barlow Monument Site	25.0 sq. ft.	Mt. Hood Loop Hwy. at Government Camp	Part of Lot 4, Blk. 11, Townsite of Pompeii	Harvey G. Starkweather and wife, Portland	Gift	.....	Monument erected by Sons and Daughters of Oregon Pioneers
Clatsop	Bradley Park	18.08	Columbia Riv. Hwy., 5 miles W. of Westport	S. ½ of SE. ¼ of SW. ¼ of Sec. 16, T. 8 N., R. 6 W., W. M.	Heirs of Bradley Estate, Astoria	Gift	.....	Parking space, rest rooms, water, lights, sewer, caretaker, etc.
Columbia	Unnamed	1.88	Columbia Riv. Hwy., 2 miles W. of Rainier	In NE. ¼ of Sec. 18, T. 7 N., R. 2 W., W. M.	John F. Ditto and wife, Rainier	Purchase	600.00	Parking space
Curry	Unnamed	30.6	Roosevelt Coast Hwy., 4 miles S. of Port Orford	In Secs. 23 and 26, T. 33 S., R. 15 W., W. M.	Carl White and wife Port Orford	Purchase	1,500.00	None
Curry	Cape Sebastian Park	241.8	Roosevelt Coast Hwy., 6 miles S. of Gold Beach	In Sec. 36, T. 37 S., R. 15 W., W. M., and Sec. 1, T. 38 S., R. 15 W., W. M.	Geo. W. Henry and wife, Gold Beach	Purchase	6,100.00	None
Curry	Unnamed	17.58	Roosevelt Coast Hwy., 1 mile N. of Brookings	In SW. ¼ of Sec. 36, T. 40 S., R. 14 W., W. M.	Bauers and Bauers, Dayton, Wash.	Purchase	572.76	None
Curry	Unnamed	9.0	Roosevelt Coast Hwy., between Euchre Crk. and Rogue Riv.	In SW. ¼ of NW. ¼ of Sec. 17, T. 35 S., R. 14 W., W. M.	H. E. James and wife, Ophir	Purchase	225.00	None

Curry	Unnamed	290.09	Roosevelt Coast Hwy. on Humbug Mountain	In Secs. 25, 26 and 35, T. 33 S., R. 15 W., W. M.	U. S. Government	Acquired under Act of June 14, 1926	.....	None
Deschutes	Lava River Caves Park	22.5	The Dalles-Cal. Hwy., 11 miles S. of Bend	In SE. ¼ of Sec. 26, T. 19 S., R. 11 E., W. M.	The Shevlin-Hixon Co., Bend	Gift	.....	Roadways, trails, parking space, rest rooms
Deschutes	Terrence H. Foley Park	150.0	Pilot Butte near Bend on the Central Ore. Hwy.	In Secs. 33 and 34, T. 17 S., R. 12 E., W. M.	Chas. A. Brown, Kempster B. Miller and Francis R. Welles	Gift	.....	Roadway, parking space and observation area
Deschutes	Unnamed	40.0	The Dalles-Cal. Hwy., 1 mile N. of Bend	NW. ¼ of SE. ¼ of Sec. 20, T. 17 S., R. 12 E., W. M.	U. S. Government	Exchange of school land scrip	.....	None
Douglas	Booth Park	6.8	Pacific Hwy., 2 miles N. of Myrtle Creek	In Secs. 19 and 20, T. 29 S., R. 5 W., W. M.	J. H. Booth and wife, Roseburg	Gift	.....	None
Douglas	Camas Mountain Park	160.0	Coos Bay-Roseburg Hwy. at Summit of Camas Mountain	S. ½ of NW. ¼ and W. ½ of NE. ¼ of Sec. 9, T. 29 S., R. 8 W., W. M.	U. S. Government	Purchase under amended Act of June 14, 1926	.....	Water supply
Grant	Unnamed	0.79	John Day Hwy. at Johnny Kirk Springs	In SE. ¼ of Sec. 7 and NE. ¼ of Sec. 18, T. 11 S., R. 26 E., W. M.	Charles W. Hoffman	Gift	.....	Water supply
Hood River	Viento	3.6	Columbia River Hwy., 7 miles W. of Hood River	Part of SE. ¼, Sec. 34, T. 3 N., R. 9 E., W. M.	The Pacific Telephone & Telegraph Co., Portland	Gift	.....	Water supply, parking space, picnic grounds
Hood River	Unnamed	11.5	Columbia River Hwy., 2 miles W. of Cascade Locks	Part of Lot 4, Sec. 14, T. 2 N., R. 7 E., W. M.	O.-W. R. & N. Co., Portland	Purchase	1,080.00	None
Hood River	Unnamed	15.07	Columbia River Hwy., near Hood River-Wasco Co. line	In E. ½ of NE. ¼ of Sec. 31, T. 3 N., R. 11 E., W. M.	Martha Aleck (Indian), Warmsprings	Purchase	396.75	None
Hood River	Unnamed	28.60	Columbia River Hwy., near Hood River-Wasco Co. line	In N. ½ of SW. ¼ of Sec. 32, T. 3 N., R. 11 E., W. M.	Thomas Jim (Indian), Warmsprings	Purchase	963.80	None
Hood River	Unnamed	36.83	Columbia River Hwy., near Hood River-Wasco Co. line	In Sec. 4, T. 2 N., R. 11 E., W. M., and Sec. 33, T. 3 N., R. 11 E., W. M.	Katie Coon (Indian), Warmsprings	Purchase	441.96	None
Hood River	Unnamed	21.0	Columbia River Hwy., near Hood River-Wasco Co. line	In S. ½ of SE. ¼ of Sec. 32, T. 3 N., R. 11 E., W. M.	Chas. Johnson (Indian), Warmsprings	Purchase	440.00	None
Jefferson and Deschutes	Peter Skene Ogden Park	102.86	The Dalles-Cal. Hwy., 8 miles N. of Redmond	Part of S. ½ of SE ¼, Sec. 32, T. 13 S., R. 13 E., W. M., and Lots 1 and 2 of Sec. 5, T. 14 S., R. 13 E., W. M.	Oregon Trunk Ry. Co. and U. S. Government	Purchase, gift and exchange of school land	615.98	Water right, parapet wall and parking space
Lake	Chandler Park	63.2	Fremont Hwy., 16 miles N. of Lakeview	In W. ½ of Sec. 31, T. 36 S., R. 21 E., NE. ¼ of Sec. 6, T. 37 S., R. 21 E., and NE. ¼ of Sec. 1, T. 37 S., R. 20 E., W. M.	S. B. Chandler and wife and Frank Loveless and wife, Lakeview	Gift	.....	Water supply
Lake	Unnamed	50.0	Klamath Falls-Lakeview Hwy., 13 miles W. of Lakeview	In SE. ¼ of Sec. 9, T. 39 S., R. 18 E., W. M.	Oregon Land & Livestock Co., Eugene	Gift	.....	Water supply

TABLE No. 40—Continued

County	Name of Park	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration	Development
Lane and Benton	Unnamed	37.3	Westside Pac. Hwy. at Benton-Lane Co. line	In S. ½ of Sec. 12, T. 15 S., R. 5 W., W. M.	W. C. Washburn and wife, Junction City	Purchase	$5,000.00	None
Lincoln	Unnamed	5.83	Roosevelt Coast Hwy. at Boiler Bay, 14 miles N. of Newport	In Lot 5, Sec. 32, T. 8 S., R. 11 W., W. M.	Lumberman's Trust Co., Portland	Purchase	291.50	None
Lincoln	Unnamed	55.8	Roosevelt Coast Hwy. at Rocky Creek, 10 miles N. of Newport	Lot 3, Sec. 18, part of Lot 1, Sec. 19, and W. ½, NW. ¼, NW. ¼, Sec. 20, T. 9 S., R. 11 W., W. M.	U. S. Government and heirs of John Brown estate	Purchase	1,120.00	None
Lincoln	Devils Punch Bowl	4.36	Roosevelt Coast Hwy. at Otter Rock	In S. ½ of NW. ¼ of Sec. 32, T. 9 S., R. 11 W., W. M.	F. W. Leadbetter and wife, Portland	Gift	.....	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lot 4, Block 3, first addition to town of Yachats	P. W. Southwick and wife, Klamath Agency	Purchase	200.00	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lot 3, Block 3, first addition to town of Yachats	G. C. Webb and wife, Seaside	Purchase	200.00	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lot 5, Block 3, first addition to town of Yachats	Chas. A. Lounsbury and wife, Portland	Purchase	175.00	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lot 36, Block 2, first addition to town of Yachats	Elvin C. Crum and wife, Salem	Purchase	300.00	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lot 40, Block 2, first addition to town of Yachats	Oliver C. Gunderson and wife, Eugene	Purchase	1,150.00	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lot 38, Block 2, first addition to town of Yachats	Chas. D. Helmick and wife	Purchase	1,150.00	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lots 1, 2, 37 and 39, Block 2, in first addition to town of Yachats	J. A. Kraft and wife, Portland	Purchase	1,435.50	None
Lincoln	Unnamed	.....	Roosevelt Coast Hwy. at Yachats	Lots 1, 2, 3, 4, 5, 38, 39, 40, 41 and 42, Block 1, Lots 3, 4, 5 and 35, Block 2, and Lots 1 and 2, Block 3, first addition to Yachats	Lumberman's Trust Co., Portland	Purchase	1,600.00	None
Lincoln	Unnamed	1.48	Roosevelt Coast Hwy., 10 miles N. of Newport	In Lots 2 and 3, Sec. 29, T. 9 S., R. 11 W., W. M.	W. S. Badley and wife, Portland	Purchase	500.00	Parking space
Polk	Holman Park	8.62	Salem-Dallas Hwy., 6 miles W. of Salem	In Sec. 30, T. 7 S., R. 3 W., W. M.	Thomas Holman and wife, Eola	Purchase	1,000.00	Water supply, parking space
Polk	Helmick Park	5.46	Westside Pac. Hwy., 6 miles S. of Monmouth	In SE. ¼, Sec. 13, T. 9 S., R. 5 W. and SW. ¼ of Sec. 18, T. 9 S., R. 4 W., W. M.	Sarah Helmick, James Helmick and wife, Dallas	Gift	.....	None

Umatilla	Emigrant Park	14.22	Old Oregon Trail, 3 miles W. of Meacham	In N. ½ of NE. ¼ of Sec. 29, T. 1 N., R. 35 E., W. M.	O. P. Bowman and wife of Pendleton and L. L. Mann and wife of Pendleton	Condemnation and purchase	3,271.60	Water supply, camping facilities, rest rooms, parking space
Umatilla	Unnamed	20.16	Old Oregon Trail, 12 miles E. of Pendleton	The E. ½ of Lot 2, Sec. 6, T. 1 N., R. 34 E., W. M.	Edgar Billie, Pendleton	Purchase	320.00	None
Umatilla	Blue Mountain Timber Res.	197.24	Old Oregon Trail near Emigrant Park	In Secs. 17, 20 and 29, T. 1 N., R. 35 E., W. M.	O. P. Bowman and wife, Pendleton	Condemnation	6,800.00	None
Umatilla	Blue Mountain Timber Res.	28.16	Old Oregon Trail in Blue Mountains	In NW. ¼ of SW. ¼ of Sec. 28, T. 1 N., R. 35 E., W. M.	William S. Campbell and wife, Pendleton	Purchase	350.00	None
Umatilla	Blue Mountain Timber Res.	40.0	Old Oregon Trail in Blue Mountains	NE. ¼ of NE. ¼ of Sec. 20, T. 1 N., R. 35 E., W. M.	S. H. Forshaw and wife, Pendleton	Purchase	500.00	None
Umatilla	Blue Mountain Timber Res.	8.72	Old Oregon Trail in Blue Mountains	In SW. ¼ of SW. ¼ of Sec. 28, T. 1 N., R. 35 E., W. M.	W. W. Harrah and wife, Pendleton	Purchase	243.60	None
Umatilla	Blue Mountain Timber Res.	28.23	Old Oregon Trail in Blue Mountains	In SW. ¼ of SW. ¼ of Sec. 9, T. 1 N., R. 35 E., W. M.	Celia Kilby, Newport	Purchase	438.00	None
Umatilla	Blue Mountain Timber Res.	160.00	Old Oregon Trail in Blue Mountains	S. ½ of NW. ¼ and N. ½ of SW. ¼ of Sec. 9, T. 1 N., R. 35 E., W. M.	William Lahti and wife, Pendleton	Purchase	4,000.00	None
Umatilla	Blue Mountain Timber Res.	39.12	Old Oregon Trail in Blue Mountains	In SE. ¼ of SE. ¼ of Sec. 17, T. 1 N., R. 35 E., W. M.	Edward Lyday and wife, Pendleton	Purchase	600.00	None
Umatilla	Blue Mountain Timber Res.	8.79	Old Oregon Trail in Blue Mountains	In SW. ¼ of NW. ¼ of Sec. 28, T. 1 N., R. 35 E., W. M.	A. Leme estate	Purchase	46.95	None
Umatilla	Blue Mountain Timber Res.	65.1	Old Oregon Trail in Blue Mountains	SW. ¼ of NE. ¼ of Sec. 29, and part of NW. ¼ of SE. ¼ of Sec. 20, T. 1 N., R. 35 E., W. M.	L. L. Mann and wife, Pendleton	Purchase	900.00	None
Umatilla	Blue Mountain Timber Res.	124.97	Old Oregon Trail in Blue Mountains	In Secs. 10 and 11, T. 1 N., R. 35 E., W. M.	J. E. Smith Livestock Co., Meacham	Perpetual lease	100.00	None
Umatilla	Blue Mountain Timber Res.	318.684	Old Oregon Trail in Blue Mountains	In Secs. 14, 23 and 24, T. 1 N., R. 35 E., W. M.	J. E. Smith Livestock Co., Meacham	Purchase	1,834.45	None
Umatilla	Blue Mountain Timber Res.	3.66	Old Oregon Trail in Blue Mountains	In NE. ¼ of SW. ¼ of Sec. 28, T. 1 N., R. 35 E., W. M.	Charlotte B. Schroeder and husband, Pilot Rock	Purchase	48.30	None
Umatilla	Blue Mountain Timber Res.	10.9	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of NE. ¼ of Sec. 8, T. 1 N., R. 35 E., W. M.	Melvina Picard (Indian), Umatilla	Purchase	280.37	None
Umatilla	Blue Mountain Timber Res.	12.85	Old Oregon Trail in Umatilla Indian Res.	In NW. ¼ of NE. ¼ of Sec. 8, T. 1 N., R. 35 E., W. M.	Walter Picard (Indian), Umatilla	Purchase	455.96	None
Umatilla	Blue Mountain Timber Res.	8.31	Old Oregon Trail in Umatilla Indian Res.	In N. ½ of SW. ¼ of Sec. 3, T. 1 N., R. 34 E., W. M.	Julia Minthorn (Indian) Umatilla	Purchase	103.44	None
Umatilla	Blue Mountain Timber Res.	34.69	Old Oregon Trail in Umatilla Indian Res.	In E. ½ of SW. ¼ of Sec. 5, T. 1 N., R. 35 E., W. M.	Thos. and Stella Shillal (Indians), Umatilla	Purchase	1,210.62	None
Umatilla	Blue Mountain Timber Res.	10.27	Old Oregon Trail in Umatilla Indian Res.	In NE. ¼ of SE. ¼ of Sec. 4, T. 1 N., R. 34 E., W. M.	Mary Johnson (Indian), Umatilla	Purchase	144.21	None
Umatilla	Blue Mountain Timber Res.	11.72	Old Oregon Trail in Umatilla Indian Res.	In NE. ¼ of SE. ¼ of Sec. 6, T. 1 N., R. 35 E., W. M.	Arthur Parr (Indian), Umatilla	Purchase	229.10	Water supply

TABLE No. 40—Continued

County	Name of Park	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration	Development
Umatilla	Blue Mountain Timber Res.	36.83	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of NE. ¼ of Sec. 2, T. 1 N., R. 34 E., W. M.	Willie Williams (Indian), Umatilla	Purchase	$ 670.99	None
Umatilla	Blue Mountain Timber Res.	17.22	Old Oregon Trail in Umatilla Indian Res.	In NW. ¼ of SE. ¼ of Sec. 3, T. 1 N., R. 34 E., W. M.	Elizabeth P. Shillal (Indian), Umatilla	Purchase	234.39	None
Umatilla	Blue Mountain Timber Res.	5.26	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of NW. ¼ of Sec.1, T. 1 N., R. 34 E., W. M.	Annie Hayes (Indian), Umatilla	Purchase	387.98	None
Umatilla	Blue Mountain Timber Res.	33.79	Old Oregon Trail in Umatilla Indian Res.	In W. ½ of SW. ¼ of Sec. 5, T. 1 N., R. 35 E., W. M.	Phillip Shillal (Indian), Umatilla	Purchase	1,272.89	None
Umatilla	Blue Mountain Timber Res.	7.58	Old Oregon Trail in Umatilla Indian Res.	In NE. ¼ of SE. ¼ of Sec. 8, T. 1 N., R. 35 E., W. M.	Lillian Allen (Indian), Umatilla	Purchase	282.64	None
Umatilla	Blue Mountain Timber Res.	12.74	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of SE. ¼ of Sec. 4, T. 1 N., R. 34 E., W. M.	Wapona (Indian), Umatilla	Purchase	136.16	None
Umatilla	Blue Mountain Timber Res.	48.08	Old Oregon Trail in Umatilla Indian Res.	In N. ½ of NW. ¼ of Sec. 1, T. 1 N., R. 34 E., W. M.	Bertha Martin (Indian), Umatilla	Purchase	1,399.35	None
Umatilla	Blue Mountain Timber Res.	8.38	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of SW. ¼ of Sec. 3, T. 1 N., R. 34 E., W. M.	Tomiat (Indian), Umatilla	Purchase	99.50	None
Umatilla	Blue Mountain Timber Res.	16.85	Old Oregon Trail in Umatilla Indian Res.	In SW. ¼ of NW. ¼ of Sec. 1, T. 1 N., R. 34 E., W. M.	Joe Hayes (Indian), Umatilla	Purchase	293.53	None
Umatilla	Blue Mountain Timber Res.	18.88	Old Oregon Trail in Umatilla Indian Res.	In NW. ¼ of NE. ¼ of Sec. 1, T. 1 N., R. 34 E., W. M.	Mumsow (Indian), Umatilla	Purchase	523.98	None
Umatilla	Blue Mountain Timber Res.	11.86	Old Oregon Trail in Umatilla Indian Res.	In NE. ¼ of SE. ¼ of Sec. 1, T. 1 N., R. 34 E., W. M.	Mary Wahopa (Indian), Umatilla	Purchase	157.14	None
Umatilla	Blue Mountain Timber Res.	8.69	Old Oregon Trail in Umatilla Indian Res.	In NW. ¼ of SW. ¼ of Sec. 6, T. 1 N., R. 35 E., W. M.	Ella Thompson (Indian). Umatilla	Purchase	242.42	None
Umatilla	Blue Mountain Timber Res.	26.08	Old Oregon Trail in Umatilla Indian Res.	In SW. ¼ of NW. ¼ of Sec. 6, T. 1 N., R. 35 E., W. M.	Louise Billy (Indian), Umatilla	Purchase	436.76	None
Umatilla	Blue Mountain Timber Res.	20.48	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of NE. ¼ of Sec. 6, and in SW. ¼ of NW. ¼ of Sec. 5, T. 1 N., R. 35 E., W. M.	Albert Lavadour (Indian), Umatilla	Purchase	450.77	None
Umatilla	Blue Mountain Timber Res.	43.44	Old Oregon Trail in Umatilla Indian Res.	In NW. ¼ of Sec. 6, T. 1 N., R. 35 E., W. M.	Lucy Billy (Indian), Umatilla	Purchase	870.42	None
Umatilla	Blue Mountain Timber Res.	36.31	Old Oregon Trail in Umatilla Indian Res.	In SE. ¼ of SE. ¼ of Sec. 5, and in NE. ¼ of NE. ¼ of Sec. 8, T. 1 N., R. 35 E., W. M.	Bernice Henle (Indian), Umatilla	Purchase	801.42	None

Umatilla	Blue Mountain Timber Res.	20.2	Old Oregon Trail in Umatilla Indian Res.	W. ½ of Lot 2 of Sec. 6, T. 1 N., R. 34 E., W. M.	Edgar Billy (Indian), Umatilla	Purchase	161.60	None
Umatilla	Blue Mountain Timber Res.	21.8	Old Oregon Trail in Umatilla Indian Res.	In SW. ¼ of SE. ¼ of Sec. 5, T. 1 N., R. 35 E., W. M.	Saashawamee (Indian), Umatilla	Purchase	821.54	None
Umatilla and Union	Blue Mountain Timber Res.	46.406	Old Oregon Trail in Blue Mountains	In Sec. 1, T. 2 S., R. 35 E., W. M., and in Sec. 7, T. 1 N., R. 36 E., W. M.	J.E. Smith Livestock Co., Meacham	Purchase	232.00	None
Union	Gangloff Park	2.49	Old Oregon Trail at W. limits of La Grande	In SE. ¼ of NW. ¼ of Sec. 6, T. 3 S., R. 38 E., W. M.	Mary T. Foley, La Grande	Gift	.....	Monument erection by citizens of La Grande
Union	Blue Mountain Timber Res.	17.791	Old Oregon Trail in Blue Mountains	In NE. ¼ of NW. ¼ of Sec. 1, T. 2 S., R. 35 E., W. M.	John Adams and wife, Adams	Purchase	88.95	None
Union	Blue Mountain Timber Res.	40.0	Old Oregon Trail in Blue Mountains	SE. ¼ of NW. ¼ of Sec. 1, T. 2 S., R. 35 E., W. M.	U. S. Government	Exchange of school land	.....	None
Union	Blue Mountain Timber Res.	46.95	Old Oregon Trail in Blue Mountains	In N. ½ of SE. ¼ of Sec. 21, T. 2 S., R. 36 E., W. M.	Marion Jack and wife, Pendleton	Purchase	284.75	None
Union	Blue Mountain Timber Res.	5.036	Old Oregon Trail in Blue Mountains, 3 miles E. of Kamela	In NW. ¼ of SE. ¼ of Sec. 20, T. 2 S., R. 36 E., W. M.	G. W. Klopfenstein and wife, La Grande	Gift	.....	None
Union	Blue Mountain Timber Res.	25.267	Old Oregon Trail in Blue Mountains	In SE. ¼ of SW. ¼ of Sec. 17, T. 2 S., R. 36 E., W. M.	G. W. McDowell, Echo	Purchase	157.35	None
Union	Blue Mountain Timber Res.	62.748	Old Oregon Trail in Blue Mountains	In Secs. 1 and 12, T. 2 S., R. 35 E., W. M.	John B. Wilson and wife, Elgin	Purchase	310.99	None
Union	Blue Mountain Timber Res.	69.98	Old Oregon Trail in Blue Mountains	In W. ½ of Sec. 36, T. 1 S., R. 35 E., W. M.	C. A. Norden and wife, Pendleton	Purchase	664.90	None
Wallowa	Wallowa Timber Res.	47.0	La Grande-Wallowa Lake Hwy., 6 miles E. of Minam	In S. ½ of NW. ¼ and SW. ¼ of NE. ¼, Sec. 36, T. 2 N., R. 41 E., W. M.	Ernest F. Johnson and wife, Wallowa	Purchase	1,386.60	None
Wallowa	Wallowa Timber Res.	10.64	La Grande-Wallowa Lake Hwy., E. of Minam	In N. ½ of Sec. 27, T. 2 N., R. 41 E., W. M.	Ada Boyd, Wallowa	Purchase	308.15	None
Wallowa	Wallowa Timber Res.	20.89	La Grande-Wallowa Lake Hwy., E. of Minam	In Sec. 26, T. 2 N., R. 41 E., W. M.	Ed Copeland and wife, Parma, Idaho	Purchase	255.98	None
Wasco	Mayer Park	260.0	Columbia River Hwy. at Rowena Heights	S. ½ of SW. ¼ of SW. ¼ Sec. 2, SE. ¼, Sec. 3, NE. ¼ of NE. ¼, Sec. 10, NW. ¼ of NW. ¼, Sec. 11, T. 2 N., R. 12 E., W. M.	Mark A. Mayer, The Dalles	Gift	.....	Roadway, parking space, parapet wall
Wasco	Memaloose Park	2.64	Columbia River Hwy., 2 miles E. of Mosier	In S. ½ of SW. ¼, Sec. 32, T. 3 N., R. 12 E., W. M.	Roy D. Chatfield and wife, Mosier	Gift	.....	None
Wheeler	Shelton Park	3.38	John Day Hwy., 11 miles S. of Fossil	In SE. ¼ of SE. ¼ of Sec. 4, T. 8 S., R. 22 E., W. M.	Kinzua Lumber Co., Santa Barbara, Cal.	Gift	.....	Water supply, parking space

TABLE No. 41

LIST OF RIGHTS OF WAY ACQUIRED BY THE STATE HIGHWAY COMMISSION

November 30, 1928

County	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Baker	0.25	Old Oregon Trail, 6½ miles southeast of Haines	In SE. ¼ of SE. ¼ of Sec. 25, T. 8 S., R. 39 E., W. M.	Harry S. Bowen and wife	Gift	$.....
Baker	1.12	Old Oregon Trail, 6 miles southeast of Haines	In W. ½ of SE. ¼ of Sec. 25, T. 8 S., R. 39 E., W. M.	Trena Hodgins	Purchase	25.00
Baker	4.45	John Day Highway at junction with Baker-Unity Highway	In SW. ¼ of Sec. 5, T. 13 S., R. 37 E., W. M.	Myra Weatherford, Unity	Purchase	150.00
Clackamas and Wasco	.....	Mt. Hood Highway between Sandy and Wapinitia	"The Mt. Hood and Barlow Road"	George W. Joseph and wife, Portland	Gift	.....
Clackamas	0.424	Pacific Highway, 1 mile south of Canemah	In NW. ¼ of Sec. 1, T. 35 S., R. 1 E., W. M.	T. B. Long and wife, Oregon City	Purchase	1,300.00
Clackamas	1.06	Pacific Highway between Canemah and New Era	In Sec. 23, T. 3 S., R. 1 E., W. M.	Joseph Andree and wife	Purchase	200.00
Clackamas	0.082	Pacific Highway at New Era	Part of Lots 1, 2, 3 and 4 of Block 3, townsite of New Era	Herman Anthony and wife	Purchase	50.00
Clackamas	2.62	Pacific Highway, ½ mile south of New Era	In Sec. 23, T. 3 S., R. 1 E., W. M.	George H. Brown and wife	Purchase	230.50
Clackamas	5.6	Pacific Highway between Canemah and New Era	In SW. ¼ of Sec. 11, and NW. ¼ of Sec. 14, T. 3 S., R. 1 E., W. M.	John Bradtl and wife	Purchase	100.00
Clackamas	.....	Pacific Highway, 2 miles north of New Era	In Milton Brown D. L. C. No. 38, T. 3 S., R. 1 E., W. M.	Grant T. Critiser and wife	Purchase	50.00
Clackamas	0.447	Mt. Hood Highway at Rhododendron	In Secs. 2 and 11, T. 3 S., R. 7 E., W. M.	W. F. Cash and wife	Purchase	750.00
Clackamas	7.99	Pacific Highway between Canemah and New Era	In Secs. 1, 2 and 11, T. 3 S., R. 1 E., W. M.	Crown Willamette Paper Co., Oregon City	Purchase	10.00
Clackamas	0.023	Mt. Hood Highway at Government Camp	Part of Lots 5 of Block 11 and 1 of Block 10, townsite of Pompeii	D. J. Finn and wife	Purchase and exchange	1.00
Clackamas	.....	Mt. Hood Highway at Rhododendron	Through Franzette Addition in Sec. 11, T. 3 S., R. 7 E., W. M.	Susette Franzette	Purchase	1,000.00
Clackamas	0.19	Mt. Hood Highway at Government Camp	Lots 7 and 8 of Block 10, townsite of Pompeii	M. J. Fenton and wife, Portland	Purchase	250.00
Clackamas	0.017	Mt. Hood Highway at Government Camp	Part of Lot 6 of Block 10, townsite of Pompeii	J. H. Gibson et. al., McMinnville	Purchase	25.00
Clackamas	1.76	Pacific Highway at Pulp	In Milton Brown D. L. C. No. 38, T. 3 S., R. 1 E., W. M.	Hawley Pulp and Paper Co., Oregon City	Purchase	302.65
Clackamas	0.009	Mt. Hood Highway at Government Camp	Part of Lots 7 and 8 of Block 4, townsite of Pompeii	A. C. Howland and wife, Oregon City	Purchase	22.50
Clackamas	.....	Pacific Highway, ¼ mile north of New Era	In Secs. 22 and 23, T. 3 S., R. 1 E., W. M.	Frank Hess	Purchase	192.00
Clackamas	0.45	Mt. Hood Highway at Government Camp	In NW. ¼ of NW. ¼ of Sec. 23, T. 3 S., R. 8½ E., W. M.	Francis C. Little and wife	Purchase	800.00

Clackamas	0.131	Mt. Hood Highway at Mt. Hood Forest Boundary	In NE. ¼ of NE. ¼ of Sec. 23, T. 3 S., R. 8½ E., W. M.	Mrs. M. L. Morrison	Purchase	200.00
Clackamas	0.1	Mt. Hood Highway at Camp Creek near Government Camp	In NE. ¼ of NE. ¼ of Sec. 24, T. 3 S., R. 8 E., W. M.	Geo. Prosser	Purchase	200.00
Clackamas		Pacific Highway, 1 mile north of New Era	In Alfrey D. L. C. No. 37, T. 3 S., R. 1 E., W. M.	Joe Pfister and wife	Purchase	80.00
Clackamas	0.046	Mt. Hood Highway at Rhododendron	Part of Block "B," Rhododendron Subdivision, in Sec. 11, T. 3 S., R. 7 E., W. M.	Dave Raffety and wife	Gift	.....
Clackamas	0.166	Mt. Hood Highway at Government Camp	Part of Lots 3 and 4 of Block 11, townsite of Pompeii	Benjamin F. Smith, Fort Rock	Purchase	200.00
Clackamas	0.046	Mt. Hood Highway at Government Camp	South 20 feet of Lots 7 and 8 of Block 3, townsite of Pompeii	E. J. Sickler and wife, Government Camp	Purchase	100.00
Clackamas	0.023	Mt. Hood Highway at Government Camp	South 20 feet of Lot 5 of Block 3, townsite of Pompeii	E. J. Sickler and wife, Government Camp	Purchase	50.00
Clackamas	25 sq. ft.	Mt. Hood Highway at Government Camp	Part of Lot 4 of Block 12, townsite of Pompeii	A. W. Shipley and wife	Purchase	1.50
Clackamas	0.18	Pacific Highway at Barlow	Part of Lot 3, Block 15, of First Addition to Barlow	P. H. Smith	Purchase	625.00
Clackamas	0.023	Mt. Hood Highway at Government Camp	South 20 feet of Lot 6, Block 3, townsite of Pompeii	Belle A. Sleight, Portland	Purchase	50.00
Clackamas	0.057	Mt. Hood Highway at Government Camp	Part of Lots 1 and 2, of Block 11, townsite of Pompeii	Mrs. Mary A. Schwarz, Portland	Purchase	150.00
Clackamas	0.88	Pacific Highway at New Era	80-foot strip in Sec. 23, T. 3 S., R. 1 E., W. M.	John Tecklenberg and wife, New Era	Purchase	750.00
Clackamas	.....	Pacific Highway between Canemah and New Era	In Alfrey D. L. C. No. 37, T. 3 S., R. 1 E., W. M.	Laura E. Thompson and husband	Gift	.....
Clackamas	0.415	Pacific Highway at Barlow	Lot 2 of Block 15 and part of Block 5, all of First Addition to Barlow	W. G. Dunkleberger, Barlow	Condemnation	750.00
Clackamas	1.05	Near Mt. Hood Highway, ½ mile southeast of Brightwood to quarry site	30-foot strip across NE. ¼ of SE. ¼ of Sec. 25, T. 2 S., R. 6 E., W. M.	U. S. Government	Sec. 24 of Federal Power Act	.....
Clatsop	0.67	Roosevelt Coast Highway at Miles Crossing	In NE. ¼ of Sec. 30, T. 8 N., R. 9 W., W. M.	Don Newell	Purchase	603.00
Clatsop	7.70	Columbia River Highway between Rock Creek and Big Noise Creek	In Secs. 14 and 15, T. 8 N., R. 7 W., W. M.	W. C. Sturnberg and wife and Jas. J. O'Keane and wife, Portland	Purchase	100.00
Columbia	1.23	Columbia River Highway near St. Helens	In NW. ¼ of SW. ¼ of Sec. 4, T. 4 N., R. 1 W., W. M.	Charles David Little et al., Fairfield, Idaho	Purchase	755.00
Coos	0.04	Coos Bay-Roseburg Highway at south limits of Coquille	In NW. ¼ of SE. ¼ of Sec. 1, T. 28 S., R. 13 W., W. M.	W. G. Mehl and wife, Coquille	Purchase	500.00
Coos	13.61	Roosevelt Coast Highway near Douglas County Line	In Sec. 1, T. 23 S., R. 13 W., and in Secs. 6 and 7, T. 23 S., R. 12 W., W. M.	Stout Lumber Co., Marshfield	Perpetual easement	.....
Crook	0.85	Ochoco Highway, 5 miles east of Prineville	In NE. ¼ of NE. ¼ of Sec. 1, T. 15 S., R. 16 E., W. M.	James W. Elliott Estate	Purchase	200.00

TABLE No. 41—Continued

County	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Considera-tion
Curry	6.92	Road to Cape Sebastian Park from Roosevelt Coast Highway	In Sec. 36, T. 37 S., R. 15 W., W. M.	Dennis Cunnif and Collier H. Buffington and wife, Gold Beach	Purchase	$ 140.00
Curry	1.051	North and south approaches to proposed bridge over Rogue River at Gold Beach	In Sec. 30, T. 36 S., R. 14 W., W. M.	Macleay Estate Co., Portland	25-year lease, expires May 6, 1952	.....
Curry	0.59	Road to Gravel Pit on Rogue River, 3 miles north of Wedderburn	Across SW. ¼ of NE. ¼ of Sec. 17, T. 36 S., R. 14 W., W. M.	Elva Miller Wood and Eva Miller, Roseburg	10-year lease, expires Sept. 1, 1936	450.00
Gilliam	.....	John Day Highway in Condon	Part of Lot 6 of Block 52, Lancaster's Addition to Condon	Bert Lear and wife	Gift	.....
Jackson	1.31	Pacific Highway at Rogue River near Gold Hill	In NE. ¼ of Sec. 22, T. 36 S., R. 3 W., W. M.	Margaret Thompson and husband	Purchase	1,000.00
Lane	1.6	Pacific Highway at south end of John B. Yeon Bridge at Harrisburg	In NE. ¼ of NW. ¼ of Sec. 16, T. 15 S., R. 4 W., W. M.	Heirs of Morris Estate, Albany	Purchase	1.00
Lane	0.88	Road to Kubli Quarry Site near Siuslaw Highway near Blachly	In S. ½ of NW. ¼ of Sec. 34, T. 16 S., R. 6 W., W. M.	Walter Carter	Lease—expires when contract No. 986 is done	100.00
Lincoln	.....	Roosevelt Coast Highway south of Yaquina Bay	In NW. ¼ of Sec. 6, and W. ½ of Sec. 18, T. 12 S., R. 11 W., W. M.	U. S. Spruce Production Corporation and Pacific Spruce Corporation	Agreement	.....
Polk	0.04	West Side Pacific Highway at junction with Salem-Dallas Highway	In town of Rickreall in Sec. 30, T. 7 S., R. 4 W., W. M.	Rickreall Lodge No. 110, A. F. & A. M., Rickreall	Purchase	100.00
Polk	1.08	McMinnville-Tillamook Highway at Valley Junction	In SW. ¼ of Sec. 9, and in SE. ¼ of Sec. 8, T. 6 S., R. 7 W., W. M.	S. A. Davis and wife	Purchase	80.00
Polk	3.41	McMinnville-Tillamook Highway at Valley Junction	In SE. ¼ of Sec. 8, and in SW. ¼ of Sec. 9, T. 6 S., R. 7 W., W. M.	J. H. Davis	Purchase	198.45
Polk	0.45	McMinnville-Tillamook Highway at Valley Junction	In SW. ¼ of Sec. 8, T. 6 S., R. 7 W., W. M.	A. L. Klees and wife	Purchase	300.00
Polk	0.49	McMinnville-Tillamook Highway at Valley Junction	In SE. ¼ of Sec. 8, T. 6 S., R. 7 W., W. M.	Eben Ray and wife	Purchase	47.60
Polk	0.382	McMinnville-Tillamook Highway at Valley Junction	In S. ½ of Sec. 8, T. 6 S., R. 7 W., W. M.	V. H. Rickert and wife	Purchase	300.00
Polk	1.63	McMinnville-Tillamook Highway at Valley Junction	In S. ½ of Sec. 8, T. 6 S., R. 7 W., W. M.	Eben Ray and wife	Purchase	232.00
Polk	1.613	McMinnville-Tillamook Highway and County Road at Valley Junction	In S. ½ of Sec. 8, T. 6 S., R. 7 W., W. M.	Walter Werth and wife	Purchase	192.00
Polk*	1.933	West Side Pacific Highway at Holmes Gap	In Sec. 5, T. 7 S., R. 4 W., W. M.	A. N. Bush and wife, Salem	Purchase	150.00
Polk*	3.08	West Side Pacific Highway at Holmes Gap	In Sec. 32, T. 6 S., R. 4 W., W. M.	Luella Chandler and husband	Purchase	261.80

Sherman	0.213	Sherman Highway, 4½ miles south of Moro	In SE. ¼ of NE. ¼ of Sec. 2, T. 2 S., R. 16 E., W. M.	L. V. Moore and wife	Purchase	21.30
Tillamook	0.22	Roadway to quarry site near McMinnville-Tillamook Highway near Three Rivers	In NE. ¼ of SE. ¼ of Sec. 24, T. 4 S., R. 10 W., W. M.	Claude M. Lane and wife	20-year lease, expires Aug. 15, 1947	10.00
Tillamook	0.20	Roadway to quarry site near McMinnville-Tillamook Highway near Three Rivers	In NE. ¼ of NE. ¼ of Sec. 24, T. 4 S., R. 10 W., W. M.	Jerry Lewallen and wife	20-year lease, expires Aug. 15, 1947	60.00
Tillamook	1.16	Roadway to quarry site near McMinnville-Tillamook Highway near Three Rivers	In NW. ¼ of SE. ¼ of Sec. 24, T. 4 S., R. 10 W., W. M.	Fred Lewallen and wife	20-year lease, expires Aug. 15, 1947	100.00
Tillamook	0.027	Roosevelt Coast Highway at Hebo	In Secs. 12 and 13, T. 4 S., R. 10 W., W. M.	P. D. Ott and wife	Purchase	276.12
Tillamook	0.18	Roosevelt Coast Highway at Barview	Part of Block 1 of First Addition to Barview	W. A. Wise and wife	Purchase	800.00
Umatilla	0.38	Old Oregon Trail at junction with Oregon-Washington Highway	In NE. ¼ of NW. ¼ of Sec. 12, T. 2 N., R. 32 E., W. M.	Mrs. Sophie Byers, Pendleton	Purchase	75.00
Union	0.65	Roadway to quarry site near Old Oregon Trail, ½ mile south of Hot Lake	In NW. ¼ of NW. ¼ of Sec. 9, T. 4 S., R. 39 E., W. M.	Mark T. Phy, Hot Lake	Gift	.....
Union	0.50	Old Oregon Trail at Black Flat	In SW. ¼ of NE. ¼ of Sec. 32, T. 2 S., R. 37 E., W. M.	A. C. Glenn and wife	Purchase	975.00
Wallowa	0.38	Road to quarry on Enterprise-Flora Highway, 11 miles north of Enterprise	In NE. ¼ of NE. ¼ of Sec. 13, T. 1 N., R. 44 E., W. M.	Clyde Sanders and wife, Enterprise	Purchase	38.00
Wallowa	0.81	Road to quarry site on Enterprise-Flora Highway, 4 miles north of Enterprise	In NW. ¼ of NE. ¼ of Sec. 14, T. 1 S., R. 44 E., W. M.	A. E. Hug and wife, Enterprise	Purchase	1.00
Wallowa	0.465	Road to quarry site on Enterprise-Flora Highway, 4 miles north of Enterprise	In NW. ¼ of NE. ¼ of Sec. 14, T. 1 S., R. 44 E., W. M.	A. E. Hug and wife, Enterprise	5-year lease, expires Nov. 20, 1931	200.00
Wasco	1.84	Columbia River Highway near Deschutes River	In Lot 2, Sec. 15, and N. ½ of Sec. 20, T. 2 N., R. 15 E., W. M.	Oregon Trunk Railway Co., Portland	Exchange of land	.....
Wasco	4.1	Columbia River Highway at west side of Deschutes River	Parts of Lots 1 and 2 of Sec. 22, and Lot 5 of Sec. 23, T. 2 N., R. 15 E., W. M.	Malcolm A. Moody, The Dalles	Agreement	.....
Wasco	2.2	Columbia River Highway, 1½ miles east of Celilo	In Lot 1 of Sec. 16, T. 2 N., R. 15 E., W. M.	J. P. Lombard, The Dalles	Purchase	10.00
Wasco	0.105	Deschutes River Road at junction with Columbia River Highway	In NW. ¼ of NW. ¼ of Sec. 26, T. 2 N., R. 15 E., W. M.	Columbia-Deschutes Power Co., Moro	Exchange of land	.....
Wasco	3.9	Deschutes River Road at junction with Columbia River Highway	In Lots 7 and 8 of Sec. 26, T. 2 N., R. 15 E., W. M.	Anne and Elizabeth Lang, The Dalles	Purchase	150.00
Wasco	0.17	The Dalles-California Highway at Maupin	In SE. ¼ of SE. ¼ of Sec. 32, T. 4 S., R. 14 E., W. M.	Oregon Trunk Railway, Portland	Perpetual easement	.....

TABLE No. 41—Continued

County	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Wasco*	.....	The Dalles-California Highway at Maupin		Deschutes River Railroad Co., Portland	Perpetual easement	$ .....
Washington	0.435	Tualatin Valley Highway at Beaverton	Across Lots 4 and 5 of Steel's Addition to Beaverton	Ida B. Alexander	Purchase	789.00
Washington	0.692	Tualatin Valley Highway at Beaverton	Across Lots 1, 3 and 4 of Steel's Addition to Beaverton	Harry A. Alexander and wife	Purchase	1,658.76
Washington	0.04	Tualatin Valley Highway between Portland and Beaverton	In Sec. 12, T. 1 S., R. 1 W., W. M.	Herbert M. Ackley and wife	Purchase	60.00
Washington	0.75	Tualatin Valley Highway between Portland and Beaverton	In NE. ¼ of Sec. 12, T. 1 S., R. 1 W., W. M.	Augustine Benz and wife, Portland	Purchase	2,000.00
Washington	220 sq. ft.	Tualatin Valley Highway at Beaverton	Across Lot 3 of Steel's Addition to Beaverton	H. J. Cox and wife	Purchase	35.00
Washington	0.334	Tualatin Valley Highway at Beaverton	Across Lots 7 and 8 of Steel's Addition to Beaverton	G. P. Fordney and wife	Purchase	500.00
Washington	814 sq. ft.	Tualatin Valley Highway at Beaverton	In Lot 6 of Block "F," Steel's Addition to Beaverton	Grace M. Guppy and husband	Purchase	175.00
Washington	0.11	Tualatin Valley Highway at Beaverton	Across Lot 73 of Steel's Addition to Beaverton	W. W. Gaskill	Purchase	429.60
Washington	0.15	Tualatin Valley Highway between Hillsboro and Cornelius	In SE. ¼ of SE. ¼ of Sec. 34, T. 1 N., R. 3 W., W. M.	Cue Griffin and wife	Purchase	150.00
Washington	0.318	Tualatin Valley Highway at Beaverton	In Block 10 of Steel's Addition to Beaverton	Thomas B. Harris and wife	Purchase	527.00
Washington	0.118	Tualatin Valley Highway at Beaverton	Across Lot 6 of Steel's Addition to Beaverton	Irene V. Heter	Purchase	177.00
Washington	0.207	Tualatin Valley Highway between Hillsboro and Cornelius	In Secs. 2 and 3, T. 1 S., R. 3 W., W. M.	C. W. James, Hillsboro	Purchase	100.00
Washington	0.023	Tualatin Valley Highway between Portland and Beaverton	In N. ½ of Sec. 15, T. 1 S., R. 1 W., W. M.	V. B. Price and wife	Purchase	250.00
Washington	0.94	Tualatin Valley Highway between Portland and Beaverton	In SE. ¼ of SE. ¼ of Sec. 1, T. 1 S., R. 1 W., W. M.	Thomas H. Prince Estate	Purchase	3,707.00
Washington	0.12	Tualatin Valley Highway between Hillsboro and Cornelius	In SW. ¼ of SW. ¼ of Sec. 35. T. 1 N., R. 3 W.. W. M.	W. E. Prickett and wife, Hillsboro	Purchase	75.00
Washington	1.012	Tualatin Valley Highway at Beaverton	In N. ½ of Sec. 15, T. 1 S., R. 1 W., W. M.	Hattie Rossi	Purchase	3,946.25
Washington	0.235	Tualatin Valley Highway at Beaverton	In Block 10 of Steel's Addition to Beaverton	Elmer Stipe and wife	Purchase	400.00
Washington	0.07	Tualatin Valley Highway at Beaverton	Across Lot 54 of Steel's Addition to Beaverton	Louis L. Walker and wife	Purchase	250.00
Washington	* 1.813	Tualatin Valley Highway at Beaverton	In Steel's Addition to Beaverton	J. F. Keller and wife	Purchase	3,811.25
Washington	* 2.212	Tualatin Valley Highway near Multnomah County Line	In SE. ¼ of SE. ¼ of Sec. 1, T. 1 S., R. 1 W., W. M.	R. C. Pointer	Condemnation	.....

TABLE No. 42

LIST OF STOCK PILE AND STORAGE SITES OWNED OR HELD UNDER LEASE BY THE STATE HIGHWAY COMMISSION

November 30, 1928

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Baker	Oil Storage Site	1.88	Old Oregon Trail near Pleasant Valley	In Sec. 23, T. 10 S., R. 41 E., W. M.	Baker County Court, Baker, Oregon	Donation	$ .....
Baker	Oil Storage Site	3.324	Old Oregon Trail, 1 mile north of Haines	In SE. ¼ of SW. ¼ of Sec. 28, T. 7 S., R. 39 E., W. M.	Baker County Court, Baker, Oregon	Donation	.....
Baker	Storage Site	0.58.	Old Oregon Trail, 2½ miles north of Lime	In NW. ¼ of SW. ¼ of Sec. 15, T. 13 S., R. 44 E., W. M.	John Reiber and wife, Lime, Oregon	10-year lease expires June 10, 1936	20.00
Baker	Storage Site	0.46	Old Oregon Trail, about 5 miles north of Baker	In SW. ¼ of NE. ¼ of Sec. 25, T. 8 S., R. 39 E., W. M.	Trena Hodgins	5-year lease, expires Dec. 5, 1932	25.00
Baker	Stock Pile Site	0.34	Baker-Unity Highway near Hereford	In NW. ¼ of NE. ¼ of Sec. 27, T. 12 S., R. 38 E., W. M.	H. L. Koontz and wife	10-year lease, expires Oct. 12, 1938	5.00
Baker	Oil Storage Site	.....	Old Oregon Trail at Durkee	40 x 69-ft. tract adjacent to railroad spur	O. W. R. & N. Co., Portland, Oregon	4-year lease, expires Dec. 31, 1930	.....
Clackamas	Stock Pile Site	1.0	Mt. Hood Highway near Cherryville	In SE. ¼ of SW. ¼ of Sec. 25, T. 2 S., R. 5 E., W. M.	Henry Briedenstein	10-year lease, expires May 17, 1937	100.00
Clackamas	Stock Pile Site	1.0	On County Road near Mt. Hood Highway about 6 miles east of Gresham	In SE. ¼ of SW. ¼ of Sec. 32, T. 1 S., R. 4 E., W. M.	Z. Fitzgerald	5-year lease, expires May 13, 1932	125.00
Clackamas	Stock Pile Site	3.1	Mt. Hood Highway, 1¼ miles west of Rhododendron	In NW. ¼ of Sec. 3, T. 3 S., R. 7 E., W. M.	U. S. Forest Service	Special Use Permit Runs Indefinitely	.....
Clackamas	Stock Pile Site	0.5	Mt. Hood Highway near Brightwood	In SE. ¼ of SE. ¼ of Sec. 32, T. 2 S., R. 7 E., W. M.	J. S. Greenwood	5-year lease, expires May 27, 1932	25.00
Clackamas	Stock Pile Site	0.72	Mt. Hood Highway, about 3 miles west of Sandy	In SE. ¼ of NW. ¼ of Sec. 10, T. 2 S., R. 4 E., W. M.	Christina A. Jarl	10-year lease, expires May 21, 1937	108.00
Clackamas	Stock Pile Site	0.48	Mt. Hood Highway, about 4 miles west of Sandy	In E. ½ of Sec. 13, T. 2 S., R. 4 E., W. M.	P. R. Meinig	5-year lease, expires May 2, 1932	125.00
Clackamas	Stock Pile Site	1.2	Mt. Hood Highway, ½ mile east of Brightwood	In NW. ¼ of Sec. 30, T. 2 S., R. 7 E., and in NE. ¼ of Sec. 25, T. 2 S., R. 6 E., W. M.	A. O. Meinig and wife	Purchase	180.00
Clackamas	Stock Pile Site	0.012	Mt. Hood Highway, ½ mile east of Brightwood	In SW. ¼ of NW. ¼ of Sec. 30, T. 2 S., R. 7 E., W. M.	L. O. Wing	Purchase	5.55
Clatsop	Stock Pile Site	.....	Roosevelt Coast Highway near Seaside	Opposite Highway Station 513 + 00	Ole Anderson, Seaside, Oregon	5-year lease, expires Jan. 29, 1932	5.00
Clatsop	Storage Site	0.23	Roosevelt Coast Highway, about 6 miles south of Necanicum	In SE. ¼ of NW. ¼ of Sec. 15, T. 4 N., R. 9 W., W. M.	A. R. Miller and wife	3-year lease, expires Aug. 3, 1930	50.00
Coos	Storage Site	0.2	Roosevelt Coast Highway, 6 miles east of Bandon	In Lot 5 of Sec. 25, T. 28 S., R. 14 W., W. M.	Louis Sell, Bandon, Oregon	5-year lease, expires Oct. 15, 1929	75.00

TABLE No. 42—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Coos	Storage Site	0.11	Roosevelt Coast Highway, 1 mile east of Bandon	In SW. ¼ of NE. ¼ of Sec. 29, T. 28 S., R. 14 W., W. M.	Bandon Beach Realty Co., Bandon, Oregon	5-year lease, expires Oct. 1, 1929	$ 25.00
Coos	Stock Pile Site	0.37	Roosevelt Coast Highway, 3½ miles west of Coquille	In NE. ¼ of SW. ¼ of Sec. 33, T. 27 S., R. 13 W., W. M.	Jos. Collier and wife	5-year lease, expires May 1, 1933	100.00
Coos	Stock Pile Site	0.54	Coos Bay-Roseburg Highway, 3½ miles south of Coquille	In W. ½ of NE. ¼ of Sec. 19, T. 28 S., R. 12 W., W. M.	G. S. Davis and wife, Coquille, Oregon	5-year lease, expires Apr. 15, 1933	100.00
Coos	Stock Pile Site	0.30	Coos Bay-Roseburg Highway, 4½ miles east of Myrtle Point	In NE. ¼ of SW. ¼ of Sec. 26, T. 29 S., R. 12 W., W. M.	Ross Dey, Myrtle Point, Oregon	5-year lease, expires June 11, 1933	50.00
Coos	Stock Pile Site	0.37	Coos Bay-Roseburg Highway, 6 miles south of Coquille	In SW. ¼ of NW. ¼ of Sec. 32, T. 28 S., R. 12 W., W. M.	C. Gasner and wife, Myrtle Point, Oregon	5-year lease, expires Nov. 1, 1932	50.00
Coos	Stock Pile Site	0.50	Coos Bay-Roseburg Highway, 1 mile east of Myrtle Point	In NE. ¼ of SE. ¼ of Sec. 21, T. 29 S., R. 12 W., W. M.	Roy F. Garrett, Myrtle Point, Oregon	5-year lease, expires June 11, 1933	150.00
Coos	Stock Pile Site	0.14	Coos Bay-Roseburg Highway, ½ mile south of Coquille	In NE. ¼ of NE. ¼ of Sec. 12, T. 28 S., R. 13 W., W. M.	P. J. Jacobson and wife, Coquille, Oregon	5-year lease, expires Apr. 30, 1933	10.00
Coos	Stock Pile Site	0.35	Coos Bay-Roseburg Highway, 2 miles south of Coquille	In SE. ¼ of SW. ¼ of Sec. 7, T. 28 S., R. 12 W., W. M.	James N. Jacobson and wife, Coquille, Oregon	5-year lease, expires Apr. 15, 1933	50.00
Coos	Stock Pile Site	0.42	Coos Bay-Roseburg Highway, ½ mile south of Coquille	In NE. ¼ of NE. ¼ of Sec. 12, T. 28 S., R. 13 W., W. M.	P. J. Jacobson and wife, Coquille, Oregon	5-year lease, expires Apr. 30, 1933	10.00
Coos	Stock Pile Site	0.2	Coos Bay-Roseburg Highway, 1½ miles north of Myrtle Point	In NE. ¼ of NE. ¼ of Sec. 5, T. 29 S., R. 12 W., W. M.	Martha McNair and Henry Detlefson and wife	5-year lease, expires Apr. 15, 1933	35.00
Coos	Storage Site	.....	Coos Bay-Roseburg Highway at Myrtle Point	Small tract near S. P. turntable	S. P. Railway Co.	1-year lease, expires Apr. 1, 1929	60.00
Coos	Stock Pile Site	0.25	Coos Bay-Roseburg Highway, ½ mile south of Coquille	In NE. ¼ of NE. ¼ of Sec. 12, T. 28 S., R. 13 W., W. M.	D. F. Thompson and wife, Coquille, Oregon	5-year lease, expires Apr. 30, 1933	12.50
Coos	Stock Pile Site	0.07	Coos Bay-Roseburg Highway, ½ mile south of Coquille	In NE. ¼ of NE. ¼ of Sec. 12, T. 28 S., R. 13 W., W. M.	D. F. Thompson and wife, Coquille, Oregon	5-year lease, expires Apr. 30, 1933	12.50
Curry	Storage Site	0.56	Roosevelt Coast Highway near Langlois	In NE. ¼ of NE. ¼ of Sec. 10, T. 31 S., R. 15 W., W. M.	W. U. Sabin and wife, Bandon, Oregon	5-year lease, expires Jan. 1, 1932	.....
Douglas	Storage Site	0.057	Roosevelt Coast Highway in Reedsport	50 x 50-ft. tract at intersection of railroad property and Winchester avenue	S. P. Railway Co.	1-year lease, expires Oct. 5, 1929	25.00
Gilliam	Stock Pile Site	0.94	Oregon-Washington Highway near Ewing	In NE. ¼ of NW. ¼ of Sec. 1, T. 2 N., R. 22 E., W. M.	Grover C. Curtis and wife	Purchase	20.00

Gilliam	Stock Pile Site	0.48	Oregon-Washington Highway, 1 mile south of Heppner Junction	In SW. ¼ of NE. ¼ of Sec. 36, T. 4 N., R. 22 E., W. M.	J. F. Deos and wife	Purchase	25.00
Gilliam	Stock Pile Site	0.30	John Day Highway, 3 miles north of Mayville	In SE. ¼ of SE. ¼ of Sec. 15, T. 5 S., R. 21 E., W. M.	B. F. Greiner and wife, Condon, Oregon	5-year lease expires May 31, 1933	10.00
Gilliam	Stock Pile Site	0.28	John Day Highway, about 6 miles south of Condon	In S. ½ of NW. ¼ of Sec. 9, T. 5 S., R. 21 E., W. M.	R. J. Greiner and wife	20-year lease, expires May 31, 1948	25.00
Gilliam	Stock Pile Site	0.56	John Day Highway in town of Mayville	Lots 1 and 4 of Block 3, townsite of Clyde (Mayville)	William G. Keys and wife	Purchase	50.00
Gilliam	Stock Pile Site	0.57	John Day Highway at Gwendolyn	In NE. ¼ of NW. ¼ of Sec. 36, T. 2 S., R. 21 E., W. M.	Mrs. Chloe Lynch	Purchase	.....
Gilliam	Stock Pile Site	0.345	John Day Highway at Speece	In SE. ¼ of Sec. 11, T. 2 S., R. 21 E., W. M.	O. W. R. & N. Co.	5-year lease, expires Dec. 31, 1932	12.50
Gilliam	Stock Pile Site	0.345	John Day Highway, 2 miles south of Speece	In SW. ¼ of Sec. 24, T. 2 S., R. 21 E., W. M.	O. W. R. & N. Co.	5-year lease, expires Dec. 31, 1932	12.50
Gilliam	Storage Site	0.29	Columbia River Highway, 3 miles west of Arlington	In NW. ¼ of Sec. 30, T. 3 N., R. 21 E., W. M.	Smythe Bros., Pendleton, Oregon	5-year lease, expires May 1, 1932	25.00
Gilliam	Stock Pile Site	0.52	John Day Highway, 4 miles south of Olex	In SE. ¼ of SE. ¼ of Sec. 28, T. 1 S., R. 21 E., W. M.	A. K. Smythe and Melvin Acton	5-year lease, expires Dec. 31, 1932	10.00
Gilliam	Stock Pile Site	0.57	John Day Highway, 4½ miles north of Condon	In NE. ¼ of NW. ¼ of Sec. 24, T. 3 S., R. 21 E., W. M.	A. C. Wells and wife, Condon, Oregon	5-year lease, expires Jan. 31, 1933	.....
Gilliam	Storage Site	0.53	John Day Highway, about 5 miles south of Shutlers	In W. ½ of SW. ¼ of Sec. 11, T. 1 N., R. 21 E., W. M.	J. H. Wood	5-year lease, expires Feb. 1, 1932	.....
Gilliam	Stock Pile Site	0.89	John Day Highway, 6 miles south of Olex	In SE. ¼ of Sec. 3, T. 2 S., R. 21 E., W. M.	Henry Wilkins, Arlington, Oregon	5-year lease, expires Dec. 31, 1932	10.00
Gilliam	Stock Pile Site	1.25	Old Oregon Trail, 2 miles west of Heppner Junction	In NW. ¼ of SW. ¼ of Sec. 34, T. 4 N., R. 22 E., W. M.	F. W. White and wife	Purchase	50.00
Jackson	Stock Pile Site	2.2	Crater Lake Highway, about 5 miles south of Trail	In SW. ¼ of NW. ¼ of Sec. 27, T. 34 S., R. 1 W., W. M.	Mrs. Lucy A. Connover, Trail, Oregon	3-year lease, expires July 12, 1930	50.00
Jackson	Stock Pile Site	1.29	Crater Lake Highway at Little Butte Creek	In SW. ¼ of SW. ¼ of Sec. 3, and in NW. ¼ of NW. ¼ of Sec. 10, T. 36 S., R. 1 W., W. M.	Alfred C. Mittelstaedt and wife, Eagle Point, Oregon	Purchase	100.00
Jackson	Stock Pile Site	0.17	Pacific Highway, 2 miles southeast of Rogue River	In SE. ¼ of SE. ¼ of Sec. 23, T. 36 S., R. 3 W., W. M.	Mrs. Mary Ann Pryce	5-year lease expires Aug. 15, 1932	50.00
Jackson	Storage Site	.....	Pacific Highway at Gold Hill	100 x 160-ft. one block east of S. P. Station grounds	S. P. Railway Co.	1-year lease expired Aug. 15, 1928	4.00 per mo.
Jackson	Stock Pile Site	0.26	Ashland-Klamath Falls Highway, about 5 miles east of Pacific Highway junction	In NE. ¼ of SW. ¼ of Sec. 36, T. 39 S., R. 2 E., W. M.	Wade H. Wallis and wife, Ashland, Oregon	3-year lease, expires June 30, 1930	90.00
Jefferson	Stock Pile Site	0.36	The Dalles-California Highway, 2 miles south of Culver	In SE. ¼ of SE. ¼ of Sec. 29, T. 12 S., R. 13 E., W. M.	R. C. Osburn and wife	Purchase	10.00
Jefferson	Stock Pile Site	1.0	The Dalles-California Highway, about 3 miles south of Culver	In NW. ¼ of SW. ¼ of Sec. 4, T. 13 S., R. 13 E., W. M.	James P. Read	Purchase	25.00

TABLE No. 42—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Josephine	Stock Pile Site	1.0	Redwood Highway at West Fork of Illinois River, 3 miles south of Kerby	In SE. ¼ of Sec. 21, T. 39 S., R. 8 W., W. M.	Howard Dunlap and wife, Kerby, Oregon	Purchase	$ 30.00
Josephine	Stock Pile Site	0.69	Redwood Highway near Selma	In NW. ¼ of Sec. 14, T. 38 S., R. 8 W., W. M.	Joseph Schmidt and wife	10-year lease, expires Nov. 29, 1937	.....
Klamath	Stock Pile Site	3.0	Ashland-Klamath Falls Highway, 3½ miles west of Klamath Falls	In NW. ¼ of NE. ¼ of Sec. 13, T. 39 S., R. 8 E., W. M.	John A. Benson	Purchase	210.00
Klamath	Stock Pile Site	2.0	The Dalles-California Highway near Klamath Falls-Lakeview Highway junction	In SW. ¼ of NW. ¼ of Sec. 18, T. 39 S., R. 10 E., W. M.	Irving J. Dixon	Purchase	500.00
Klamath	Stock Pile Site	2.66	The Dalles-California Highway in town of Merrill	Block 50 of South Front St.	Klamath County Court	1-year lease, expires Oct. 6, 1929	12.00
Klamath	Stock Pile Site	3.10	Klamath Falls-Lakeview Highway near Beatty	In SW. ¼ of NE. ¼ of Sec. 7, T. 37 S., R. 15 E., W. M.	Klamath County Court	1-year lease, expires Oct. 13, 1929	12.00
Klamath	Stock Pile Site	1.0	Ashland-Klamath Falls Highway, about 4 miles northeast of Keno	In NW. ¼ of NW. ¼ of Sec. 27, T. 39 S., R. 8 E., W. M.	G. G. Karns and wife, Klamath Falls, Oregon	2-year lease, expires July 7, 1930	40.00
Klamath	Stock Pile Site	2.083	The Dalles-California Highway, 7 miles south of Klamath Falls	In SE. ¼ of SE. ¼ of Sec. 25, T. 39 S., R. 9 E., W. M.	Sophia S. Henley	Purchase	.....
Lake	Storage Site	0.456	Klamath Falls-Lakeview Highway in Lakeview	100 x 200-ft. tract near junction with Fremont Highway	Harry L. Edgerton and wife	1-year lease, expired Aug. 13, 1928	.....
Lake	Storage Site	.....	Klamath Falls-Lakeview Highway in Lakeview	Part of Block 128 of Oregon Valley Land Co. Addition to Lakeview	Lake County Court	10-year lease, expires July 14, 1937	.....
Lincoln	Storage Site	0.746	Corvallis-Newport Highway at Simpson Creek, 9 miles east of Toledo	In E. ½ of SE. ¼ of Sec. 25, T. 10 S., R. 10 W., W. M.	A. R. Landess, Portland, Oregon	10-year lease, expires Sept. 1, 1934	100.00
Malheur	Stock Pile Site	0.103	Old Oregon Trail, about 3 miles north of Nyssa	In NE. ¼ of SE. ¼ of Sec. 19, T. 19 S., R. 47 E., W. M.	J. H. Forbes and wife	5-year lease, expires Dec. 23, 1931	25.00
Malheur	Stock Pile Site	0.72	Old Oregon Trail near Ontario	In NE. ¼ of SE. ¼ of Sec. 9, and in NW. ¼ of SW. ¼ of Sec. 10, T. 15 S., R. 45 E., W. M.	Maryetta Handcock	10-year lease, expires Jan. 17, 1937	200.00
Malheur	Storage Site	2.0	John Day Highway, about 3 miles east of Vale	In SW. ¼ of SE. ¼ of Sec. 22, T. 18 S., R. 45 E., W. M.	Malheur County Court	Donation	.....
Malheur	Storage Site	2.3	Weiser Spur Section of Old Oregon Trail	In NW. ¼ of SW. ¼ of Sec. 33, T. 15 S., R. 47 E., W. M.	Malheur County Court	Donation	.....
Malheur	Storage Site	1.46	Old Oregon Trail at Payette Spur Junction	In SW. ¼ of NW. ¼ of Sec. 2, T. 17 S., R. 47 E., W. M.	Malheur County Court	Donation	.....
Malheur	Storage Site	1.0	John Day Highway, about 3 miles west of Ironside	In E. ½ of NE. ¼ of Sec. 25, T. 14 S., R. 38 E., W. M.	A. R. Van Buren	10-year lease, expires Jan. 6, 1938	50.00

Morrow	Stock Pile Site	2.47	Oregon-Washington Highway, 1½ miles south of Morgan	In NW. ¼ of NE. ¼ of Sec. 27, T. 1 N., R. 23 E., W. M.	Roy L. Ekleberry and wife, Morgan, Oregon	10-year lease, expires Sept. 10, 1938	20.00
Polk	Stock Pile Site	0.34	McMinnville-Tillamook Highway, ½ mile east of Valley Junction	In SE. ¼ of Sec. 8, T. 6 S., R. 7 W., W. M.	James H. Davis	8-year lease, expires Aug. 28, 1935	45.00
Polk	Stock Pile Site	0.30	McMinnville-Tillamook Highway, ½ mile east of Valley Junction	In SE. ¼ of Sec. 8, T. 6 S., R. 7 W., W. M.	Eben Ray and wife, Willamina, Oregon	2-year lease, expires Apr. 30, 1930	30.00
Sherman	Stock Pile Site	1.1	Sherman Highway, 1 mile west of Grass Valley	In SW. ¼ of SW. ¼ of Sec. 23, T. 2 S., R. 16 E., W. M.	Eastern Oregon Land Co., Moro, Oregon	5-year lease, expires Mar. 31, 1933	10.00
Sherman	Stock Pile Site	0.50	Sherman Highway, 7½ miles north of Kent	In SE. ¼ of NE. ¼ of Sec. 25, T. 3 S., R. 16 E., W. M.	Eastern Oregon Land Co., Moro, Oregon	5-year lease, expires Mar. 31, 1933	10.00
Sherman	Stock Pile Site	0.40	Sherman Highway, 3 miles north of Grass Valley	In SE. ¼ of SE. ¼ of Sec. 10, T. 2 S., R. 16 E., W. M.	O. P. King, Grass Valley, Oregon	20-year lease, expires Apr. 30, 1948	50.00
Sherman	Stock Pile Site	0.50	Sherman Highway, 2½ miles south of Moro	In NE. ¼ of SE. ¼ of Sec. 25, T. 1 S., R. 16 E., W. M.	E. H. Moore and wife	5-year lease, expires Mar. 31, 1933	10.00
Sherman	Stock Pile Site	0.48	Sherman Highway, 3 miles north of Kent	In SW. ¼ of NW. ¼ of Sec. 8, T. 4 S., R. 17 E., W. M.	Margaret A. Moore and husband, Spokane, Wash.	5-year lease, expires Feb. 1, 1933	12.50
Tillamook	Stock Pile Site	0.23	Roosevelt Coast Highway north of Mohler	In SE ¼ of SW. ¼ of Sec. 13, T. 3 N., R. 10 W., W. M.	C. H. Graves and wife	3-year lease, expires May 5, 1930	25.00
Tillamook	Storage Site	0.373	Roosevelt Coast Highway at Haddon	In Sec. 20, T. 2 N., R. 10 W., W. M.	S. P. Railway Co.	1-year lease, expires Oct. 1, 1929	36.00
Tillamook	Storage Site	1.05	McMinnville-Tillamook Highway at junction of Three Rivers and Cedar Creek	In NE. ¼ of NE. ¼ of Sec. 24, T. 4 S., R. 10 W., W. M.	Jerry Lewallan and wife	8-year lease, expires Aug. 15, 1935	60.00
Tillamook	Storage Site	0.229	Roosevelt Coast Highway at Brighton	In Secs. 9 and 16, T. 2 N., R. 10 W., W. M.	S. P. Railway Co.	1-year lease, expires Oct. 1, 1929	36.00
Umatilla	Stock Pile Site	1.0	Old Oregon Trail on premises of Umatilla Indian School farm	In NW. ¼ of SW. ¼ of Sec. 11, T. 2 N., R. 33 E., W. M.	U. S. Department of Indian Affairs	Lease expires on 30-day notice	fence premises
Umatilla	Storage Site	.....	In towns of Blakely, Weston, Havana, Saxe, Milton, Athena and Blue Mountain	All on Railroad property at the several points.	O. W. R. & N. Co.	5-year lease, expires Dec. 31, 1931	10.00
Umatilla	Stock Pile Site	3.64	Columbia River Highway, about 15 miles west of Pendleton	In NW. ¼ of NW. ¼ of Sec. 10, and NE. ¼ of NE. ¼ of Sec. 9, T. 2 N., R. 30 E., W. M.	C. J. Spencer and wife	5-year lease, expires Aug. 2, 1933	100.00
Union	Storage Site	0.21	Old Oregon Trail, ½ mile west of Hilgard	In SW. ¼ of SE. ¼ of Sec. 31, T. 2 S., R. 37 E., W. M.	Mt. Emily Timber Co., La Grande, Oregon	5-year lease, expires Apr. 29, 1931	.....
Union	Stock Pile Site	0.48	Old Oregon Trail, about 5 miles southeast of La Grande	In SW. ¼ of NW. ¼ of Sec. 23, T. 3 S., R. 38 E., W. M.	Ernest DeLong and wife	Purchase	50.00
Union	Storage Site	0.72	Old Oregon Trail at Telocaset Overcrossing	In SE. ¼ of SE. ¼ of Sec. 29, T. 5 S., R. 40 E., W. M.	B. F. Hill and wife	5-year lease, expires Oct. 11, 1932	25.00

TABLE No. 42—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Union	Storage Site	0.40	Old Oregon Trail, about 3 miles south of Union	In NW. ¼ of NW. ¼ of Sec. 31, T. 4 S., R. 40 E., W. M.	A. B. Hempe and wife	5-year lease, expires Oct. 11, 1932	$ 25.00
Union	Storage Site	1.47	La Grande-Wallowa Lake Highway at Grande Ronde River Bridge	In SE. ¼ of SW. ¼ of Sec. 34, T. 1 N., R. 39 E., W. M.	Wm. C. Hill and wife	Purchase	25.00
Union	Stock Pile Site	1.74	County Road near Old Oregon Trail at Union	In SE. ¼ of SE. ¼ of Sec. 13, T. 4 S., R. 39 E., W. M.	John Jacobs and wife	Short term lease, expired May 31, 1928	150.00
Union	Stock Pile Site	1.45	Old Oregon Trail, about 3 miles south of Haines	In NW. ¼ of SW. ¼ of Sec. 14, T. 6 S., R. 39 E., W. M.	Mildred E. Kipling. Baker, Oregon	Purchase	35.00
Union	Stock Pile Site	0.16	La Grande-Wallowa Lake Highway, about 5 miles south of Imbler	In SW. ¼ of SE. ¼ of Sec. 7, T. 2 S., R. 39 E., W. M.	James S. Moss and wife	Purchase	20.00
Union	Storage Site	0.069	La Grande-Wallowa Lake Highway in Island City	50 x 60 foot tract on Mill Spur	O. W. R. & N. Co.	5-year lease, expires Dec. 31, 1930	.....
Union	Storage Site	0.176	La Grande-Wallowa Lake Highway at Alicel	51 x 150 foot tract in southwest corner of station grounds	O. W. R. & N. Co.	4-year lease, expires Dec. 31, 1931	10.00
Union	Storage Site	0.34	Old Oregon Trail, about 1 mile west of Hot Lake	In NW. ¼ of NW. ¼ of Sec. 31, T. 3 S., R. 39 E., W. M.	Lloyd B. Pierce and wife	5-year lease, expires Aug. 1, 1932	.....
Union	Stock Pile Site	0.74	Old Oregon Trail, about 3 miles north of Telocaset	In SE. ¼ of NW. ¼ of Sec. 17, T. 5 S., R. 40 E., W. M.	P. B. Rode and wife	5-year lease, expires Nov. 15, 1932	25.00
Union	Storage Site	0.60	La Grande-Wallowa Lake Highway, about 3 miles west of Minam	In SW. ¼ of NE. ¼ of Sec. 2, T. 1 N., R. 40 E., W. M.	Mrs. C. G. Wyatt, Hillsboro, Oregon	5-year lease, expires May 31, 1932	.....
Wallowa	Storage Site	0.30	La Grande-Wallowa Lake Highway, 3 miles east of Enterprise	In SW. ¼ of NE. ¼ of SE. 30, T. 1 S., R. 44 E., W. M.	W. R. Stein, Enterprise, Oregon	5-year lease, expired Oct. 1, 1928	25.00
Wallowa	Storage Site	0.156	La Grande-Wallowa Lake Highway, about 3 miles south of Enterprise	In SW. ¼ of NW. ¼ of Sec. 17, T. 2 S., R. 45 E., W. M.	Mrs. Jessie C. Jones, Gervais, Oregon	10-year lease, expires Nov. 16, 1937	20.00
Wallowa	Stock Pile Site	0.75	La Grande-Wallowa Lake Highway near Minam	In W. ½ of SW. ¼ of Sec. 29, T. 2 N., R. 41 E., W. M.	Minam Lumber Co., La Grande, Ore.	2-year lease, expires Oct. 31, 1929	25.00
Wallowa	Storage Site	0.254	La Grande-Wallowa Lake Highway, about 4 miles east of Elgin	In SW ¼ of NW. ¼ of Sec. 12, T. 1 N., R. 39 E., W. M.	A. H. Parsons and wife, Elgin, Oregon	5-year lease, expires July 1, 1932	.....
Wasco	Stock Pile Site	1.0	The Dalles-California Highway, 5 miles north of Maupin	In NW. ¼ of NE. ¼ of Sec. 25, T. 4 S., R. 13 E., W. M.	John McCorkle and wife	20-year lease, expires Dec. 31, 1947	50.00
Wasco	Stock Pile Site	2.11	The Dalles-California Highway, 2 miles north of Tygh Valley	In NW. ¼ of SW. ¼ of Sec. 33, T. 3 S., R. 13 E., W. M.	Alexander Ross, Tygh Valley, Oregon	Purchase	21.10
Wasco	Stock Pile Site	0.50	The Dalles-California Highway at west limits of Maupin	In SW. ¼ of SW. ¼ of Sec. 32, T. 4 S., R. 14 E., W. M.	Arabella Staats	5-year lease, expires Dec. 31, 1932	12.50

Wasco	Stock Pile Site	0.50	The Dalles-California Highway, 2 miles north of Maupin	In S. ½ of Sec. 36, T. 4 S., R. 13 E., W. M.,	Thomas B. Slusher and wife	10-year lease, expires May 31, 1948	50.00
Wheeler	Stock Pile Site	0.50	John Day Highway, 2 miles north of Fossil	In NW. ¼ of NE. ¼ of Sec. 29, T. 6 S., R. 21 E., W. M.	C. C. Busby and wife	5-year lease expires Mar. 31, 1939	10.00
Wheeler	Stock Pile Site	0.83	John Day Highway, 3½ miles north of Fossil	In SW. ¼ of NW. ¼ of Sec. 22, T. 6 S., R. 21 E., W. M.	W. W. Hoover and wife	5-year lease, expires Apr. 30, 1933	10.00
Wheeler	Stock Pile Site	0.87	John Day Highway, 2 miles southwest of Mayville	In NW. ¼ of NW. ¼ of Sec. 15, T. 6 S., R. 21 E., W. M.	W. J. Taylor and wife	5-year lease, expires Mar. 31, 1933	12.50
Yamhill	Stock Pile Site	0.99	McMinnville-Tillamook Highway, about 3 miles west of Willamina	In Sec. 33, T. 5 S., R. 8 W., W. M.	Clementine Jeffries	8-year lease, expires May 17, 1935	60.00

TABLE No. 43

LIST OF ROCK QUARRIES, GRAVEL PITS AND OTHER SOURCES OF HIGHWAY CONSTRUCTION MATERIALS OWNED OR HELD UNDER LEASE BY THE STATE HIGHWAY COMMISSION

November 30, 1928

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Baker	Gravel Pit	3.04	Old Oregon Trail at the Durkee Undercrossing	In S. ½ of Sec. 28, T. 11 S., R. 43 E., W. M.	Mount Moore and wife, Durkee	15-year lease, expires June 1, 1941	$ 152.00
Baker	Gravel Pit	80.0	Old Oregon Trail, 5 miles east of Baker	The SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼ of Sec. 1, T. 10 S., R. 40 E., W. M.	Palmer and Denham, Baker	99-year lease, expires May 25, 2025	300.00
Baker	Binder Pit	4.0	Old Oregon Trail, 5 miles south of North Powder	2 tracts in NE. ¼ of NE. ¼ of Sec. 16, T. 7 S., R. 39 E., W. M.	Armand W. Perkins, La Grande	5-year lease, expires Sept. 11, 1930	200.00
Baker	Quarry Site	40.0	Baker-Unity Highway at Burnt River Crossing	NW. ¼ of NE. ¼ of Sec. 28, T. 12 S., R. 37 E., W. M.	U. S. Government	Under terms of Sec. 17, Federal Aid Act	.....
Baker	Gravel Pit	7.28	Baker-Cornucopia Highway, 8.5 miles east of Baker	In SE. ¼ of NE. ¼ of Sec. 10, T. 9 S., R. 41 E., W. M.	E. A. King, Baker	Purchase	125.00
Baker	Quarry Site	5.0	John Day Highway between Unity and Ironside	In SW. ¼ of NW. ¼ of Sec. 18, T. 13 S., R. 38 E., W. M.	Arthur Karterman and wife, Portland	Purchase	200.00
Baker	Quarry Site	5.0	John Day Highway between Unity and Ironside	In SW. ¼ of Sec. 7, T. 14 S., R. 38 E., W. M., and SE. ¼ of Sec. 12, T. 14 S., R. 37 E., W. M.	Hardy B. Murray and wife	Purchase	200.00
Baker	Gravel Pit	3.67	Baker-Cornucopia Highway, 1 mile east of Baker	In NE. ¼ of NW ¼ of Sec. 10, T. 9 S., R. 40 E., W. M.	W. A. Pratt Estate	1-year lease, expires Sept. 1, 1927	75.00
Baker	Gravel Pit	2.5	Old Oregon Trail, 1 mile north of Baker	In E. ½ of E. ½ of Sec. 6, T. 9 S., R. 40 E., W. M.	T. N. Proffit and wife	Condemnation	821.80
Baker	Quarry Site	4.03	On County Road, 1 mile east of Haines	In NW. ¼ of NE. ¼ of Sec. 34, T. 7 S., R. 39 E., W. M.	Frank D. Stark and wife	Purchase	60.45
Baker	Gravel Pit	3.12	On County road, ½ mile from Old Oregon Trail between Baker and Haines	In N. ½ of SE. ¼ of Sec. 15, T. 8 S., R. 39 E., W. M.	J. H. Toney et al.	Purchase	275.00
Benton	Quarry Site	1.44	Alsea Highway, 2½ miles west of Alsea	In the E. ½ of Sec. 3, T. 14 S., R. 8 W., W. M.	Charlie S. Seeley, Alsea	Purchase	400.00
Benton	Quarry Site	1.2	Corvallis-Newport Highway, 1½ miles west of Philomath	In Secs. 3 and 10, T. 12 S. R. 6 W., W. M.	E. L. Kisor and wife, Philomath	Purchase	300.00
Benton	Quarry Site	10.0	Corvallis-Newport Highway, 3 miles east of Blodgett	In Sec. 18, T. 11 S., R. 6 W., W. M.	L. H. Hawley and wife, Blodgett	Purchase	1,250.00
Benton	Quarry Site	0.92	Corvallis-Newport Highway, 3 miles east of Blodgett	In Sec. 18, T. 11 S., R. 6 W., W. M.	A. J. Hodges and wife, Albany	Purchase	50.00
Benton	Quarry Site	3.0	Alsea Highway, 3 miles south of Philomath	In SE. ¼ of SE. ¼ of Sec. 20, and in NE. ¼ of NE. ¼ of Sec. 29, T. 12 S., R. 6 W., W. M.	J. L. Henkle and wife, Philomath	Purchase	350.00

Benton	Quarry Site	0.88	Corvallis-Newport Highway, 1½ miles west of Philomath	In Secs. 3 and 10, T. 12 S., R. 6 W., W. M.	Nels P. Eliason and wife	Purchase	.....
Clackamas	Quarry Site	40.0	Mt. Hood Highway near Brightwood	SW. ¼ of SE. ¼ of Sec. 25, T. 2 S., R. 6 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Clackamas	Borrow Pit	.....	Pacific Highway between Barlow and Aurora	On west side of highway between Stations 54 + 80 and 61 + 50	F. H. Hilton, Canby	Permit	100.00
Clackamas	Borrow Pit	.....	Pacific Highway between Barlow and Aurora	On west side of highway between Stations 159 + 00 and 163 + 00	W. O. Bergerson, Barlow	Permit	50.00
Clackamas	Borrow Pit	.....	Pacific Highway between Barlow and Aurora	On east side of highway between Stations 159 + 25 and 161 + 30	J. S. Workman, Woodburn	Permit	100.00
Clatsop	Quarry Site	2.47	Roosevelt Coast Highway, 2 miles north of Necanicum Postoffice	In the SE. ¼ of SE. ¼ of Sec. 17, T. 5 N., R. 9 W., W. M.	Heirs of Johannes Larsen Hjortel and Est., Astoria	Purchase	400.00
Clatsop	Quarry Site	2.47	Roosevelt Coast Highway, 2 miles north of Necanicum Postoffice	In SE. ¼ of SE. ¼ of Sec. 17, T. 5 N., R. 9 W., W. M.	C. R. March, Seaside	5-year lease, expires July 13, 1930	25.00
Coos	Quarry Site	10.15	Coos Bay-Roseburg Highway, 4 miles east of Bridge	In center of Sec. 36, T. 29 S., R. 11 W., W. M.	Charles E. Britton, Bridge	Purchase	1,000.00
Crook	Quarry Site	4.56	½ mile north of Ochoco Highway at Jones Mill	In SW. ¼ of SE. ¼ of Sec. 7, T. 14 S., R. 19 E., W. M.	The Mortgage Co. for N. A., Portland	Purchase	300.00
Crook	Gravel Pit	5.9	2½ miles north of Ochoco Highway, 7 miles east of Redmond	In SW. ¼ of NW. ¼ of Sec. 11, T. 15 S., R. 14 E., W. M.	Joseph Manceau and wife, Prineville	Purchase	1,500.00
Crook	Filler Pit	3.06	Ochoco Highway, 2½ miles west of Prineville	In NW. ¼ of Sec. 12, T. 15 S., R. 15 E., W. M.	C. E. Cross and wife, Oregon City	Purchase	100.00
Curry	Quarry Site	1.6	Roosevelt Coast Highway, 3 miles south of Brookings	In NE. ¼ of NW. ¼ of Sec. 15, T. 41 S., R. 13 W., W. M.	Vitale Pedrioli et al., Harbor	Purchase	200.00
Curry	Quarry Site	2.0	Roosevelt Coast Highway, 15 miles south of Port Orford	In Sec. 30, T. 34 S., R. 14 W., W. M.	Mary A. Colebrook Estate, Gold Beach	Condemnation	300.00
Curry	Gravel Pit	6.13	Roosevelt Coast Highway at Pistol River Bridge	In Secs. 19 and 20, T. 38 S., R. 14 W., W. M.	W. J. Walker and wife, Gold Beach	10-year lease, expires June 8, 1937	15.00 per year
Curry	Gravel Pit	1.7	Roosevelt Coast Highway at Chetco River Bridge	In Sec. 5, T. 41 S., R. 13 W., W. M.	Mark C. Wood and wife, Harbor	10-year lease, expires May 31, 1937	3c per cu. yd.
Deschutes	Quarry Site	2.0	McKenzie Highway, 5½ miles east of Sisters	In SE. ¼ of SW. ¼ of Sec. 5, T. 15 S., R. 11 E., W. M.	The Oregon-Washington Joint Stock Land Bank, Portland	Purchase	400.00
Douglas	Quarry Site	5.0	Pacific Highway, ½ mile north of Wilbur	In the SE. ¼ of NW. ¼ of Sec. 7, T. 26 S., R. 5 W., W. M.	Geo. W. Short, Jr., et al., Wilbur	Purchase	500.00
Gilliam	Quarry Site	60.82	Columbia River Highway, 1½ miles east of Arlington	In the W. ½ of the SW. ¼ of Sec. 15, T. 3 N., R. 21 E., W. M.	Northern Pacific R. R. Co., St. Paul, Minn.	Purchase	250.00
Gilliam	Filler Pit	0.8	John Day Highway, 1 mile south of Condon	In NW. ¼ of Sec. 15, T. 4 S., R. 21 E., W. M.	First National Bank of Condon, Condon	Purchase	75.00
Gilliam	Filler Pit	.....	Columbia River Highway, 4 miles east the Deschutes River	In Sec. 21, T. 3 N., R. 18 E., W. M.	Roy Phillippi, Quinton	10-year lease, expires Sept. 27, 1934	100.00

TABLE No. 43—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Gilliam	Quarry Site	4.96	On County Road, ¼ mile from John Day Highway, 6 miles south of Olex	In SW. ¼ of NE. ¼ of Sec. 36, T. 2 S., R. 21 E., W. M.	Mrs. Chloe Lynch, Portland	Purchase	$ 150.00
Gilliam	Quarry Site	3.44	John Day Highway near Arlington	In NE. ¼ of SE. ¼ of Sec. 28, T. 3 N., R. 21 E., W. M.	Mrs. Josephine Huff, Portland	.....	250.00
Gilliam	Quarry Site	7.35	Columbia River Highway at Heppner Junction	In SE. ¼ of SE. ¼ of Sec. 26, T. 4 N., R. 22 E., W. M.	F. W. White and wife	Purchase	200.00
Grant	Filler Pit	0.688	John Day Highway west of Mt. Vernon	In Lots 1 and 2 of Sec. 30, T. 13 S., R. 30 E., W. M.	Mrs. Mildred Hayes and husband	Purchase	50.00
Hood River	Quarry Site	6.89	Mt. Hood Highway at Horse Thief Meadows	In Sec. 5, T. 3 S., R. 10 E., W. M. (Unsurveyed)	U. S. Forest Service	Special use permit, expires Aug. 12, 1929	.....
Jackson	Quarry Site	20.0	Ashland-Klamath Falls Highway, 8 miles east of junction with Pacific Highway	The S. ½ of NE. ¼ of NW. ¼ of Sec. 6, T. 40 S., R. 3 E., W. M.	J. H. Groves and wife, Chiloquin	Purchase	200.00
Jackson	Quarry Site	40.0	Pacific Highway at summit of Siskiyou Mountains	NE. ¼ of SE. ¼ of Sec. 32, T. 40 S., R. 2 E., W. M.	U. S. Government and Fred C. Smith, Portland	Purchase	200.00
Jackson	Quarry Site	3.2	Pacific Highway at summit of Siskiyou Mountains	In W. ½ of Sec. 33, T. 40 S., R. 2 E., W. M.	Keith Oil and Land Co., Long Beach, Cal.	Purchase	100.00
Jackson	Quarry Site	3.16	Crater Lake Highway near Eagle Pont	In SE. ¼ of SE. ¼ of Sec. 4, and in NE. ¼ of NE. ¼ of Sec. 9, T. 36 S., R. 1 W., W. M.	Peter F. Young, Eagle Point	Purchase	500.00
Jefferson	Quarry Site	300 x 300 ft.	The Dalles-California Highway, 2 miles south of Culver City	In SE. ¼ of SE. ¼ of Sec. 29, T. 12 S., R. 13 E., W. M.	R. C. Osburn, Culver	2-year lease, expired June 15, 1928	50.00
Jefferson	Quarry Site	40.0	The Dalles-California Highway near Lyle Gap	SE. ¼ of NE. ¼ of Sec. 27, T. 9 S., R. 14 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Josephine	Quarry Site	160.0	Pacific Highway on Sexton Mountain	SE. ¼ of Sec. 26, T. 34 S., R. 6 W., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Josephine	Gravel Pit	10.15	Redwood Highway at Applegate River	In SW. ¼ of Sec. 31, T. 36 S., R. 6 W., W. M.	A. E. Sheehan and wife, Wilderville	5-year lease, expires Sept. 15, 1932	5c and 3c per cu. yd.
Josephine	Quarry Site	9.97	Redwood Highway at Slate Creek	In NE. ¼ of SE. ¼ of Sec. 10, T. 37 S., R. 7 W., W. M.	Ike Lowden and wife, Wonder	Purchase	1,000.00
Klamath	Gravel Pit	80.0	1¼ miles east of The Dalles-California Highway, 9 miles south of Klamath Falls	SE. ¼ of SW. ¼ of Sec. 32, T. 39 S., R. 10 E., and NE. ¼ of NW. ¼ of Sec. 5, T. 40 S., R. 10 E., W. M.	Elliott R. Corbett and wife, Portland	Purchase	10.00
Klamath	Gravel Pit	6.7	Ashland-Klamath Falls Highway, 5 miles west of Keno	In NE. ¼ of NE. ¼ of Sec. 32, T. 39 S., R. 7 E., W. M.	Eugene Spencer, Ashland	25-year lease, expires Aug. 15, 1948	1,100.00

Klamath	Quarry Site	3.7	The Dalles-California Highway, 1 mile north of Klamath Indian Agency	In SE. ¼ of SE. ¼ of Sec. 12, T. 34 S., R. 7½ E., W. M.	Orville Elliott and wife	Purchase	550.00
Klamath	Quarry Site	20.0	Klamath Falls-Lakeview Highway at Pine Grove, 3½ miles east of Klamath Falls	S. ½ of SW. ¼ of SW. ¼ of Sec. 4, T. 39 S., R. 10 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Klamath	Quarry Site	40.0	Klamath Falls-Lakeview Highway near Lake Co. Line	NE. ¼ of NE. ¼ of Sec. 22, T. 37 S., R. 15 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Klamath	Quarry Site	13.27	Klamath Falls-Lakeview Highway near Bly	In NW. ¼ of Sec. 34, T. 36 S., R. 14 E., W. M.	W. T. Garrett, Lakeview	20-year lease, expires Mar. 31, 1948	500.00
Klamath	Quarry Site	16.53	Ashland-Klamath Falls Highway, 4 miles west of Klamath Falls	In NE. ¼ of NW. ¼ of Sec. 13, T. 39 S., R. 8 E., W. M.	C. L. Holliday and wife, Klamath Falls	1-year lease, expires Mar. 10, 1929	10c per cu. yd.
Klamath	Quarry Site	20.0	County Road, 2 miles east of The Dalles-California Highway, 7 miles north of Merrill	S. ½ of SW. ¼ of SE. ¼ of Sec. 16, T. 40 S., R. 10 E., W. M.	State Land Board, Salem	Purchase	50.00
Lake	Quarry Site	6.6	½ mile east of Fremont Highway at Lakeview	In NE. ¼ of NE. ¼ of Sec. 15, T. 39 S., R. 20 E., W. M.	Lakeview Water Company, Lakeview	5-year lease, expires July 20, 1931	250.00
Lake	Gravel Pit	2.4	Fremont Highway, 4 miles north of Valley Falls Junction	In NE. ¼ of NE. ¼ of Sec. 13, T. 35 S., R. 20 E., and NW. ¼ of NW. ¼ of Sec. 18, T. 35 S., R. 21 E., W. M.	Wm. H. Hotchkiss and wife, Lakeview	Purchase	100.00
Lake	Gravel Pit	40.0	Fremont Highway, 3 miles north of Lakeview	SW. ¼ of NW. ¼ of Sec. 33, T. 38 S., R. 20 E., W. M.	Jerome O. Lerwick and wife, Lakeview	Lease, expires Oct. 31, 1930	100.00
Lake	Gravel Pit	0.5	Near Fremont Highway, about 4 miles south of Valley Falls	In SW. ¼ of SW. ¼ of Sec. 17, T. 36 S., R. 21 E., W. M.	H. L. Chandler and wife	10-year lease, expires June 25, 1937	fence property
Lake	Gravel Pit	40.0	Fremont Highway, 3 miles northwest of Paisley	In Secs. 10 and 15, T. 33 S., R. 18 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Lane	Borrow Pit	1.51	Pacific Highway at south end of John B. Yeon Bridge at Harrisburg	In SW. ¼ of NW. ¼ and NW. ¼ of SW. ¼ of Sec. 16, T. 15 S., R. 4 W., W. M.	George T. Scott, Harrisburg	Purchase	400.00
Lane	Quarry Site	3.6	Siuslaw Highway between Blachly and Cheshire	In SE. ¼ of SW. ¼ of Sec. 27, T. 16 S., R. 6 W., W. M.	E. J. Kubli Estate, Goldson	99-year lease, expires Aug. 31, 2026	500.00
Lane	Quarry Site	3.73	Siuslaw Highway between Blachly and Cheshire	In NW. ¼ of NW. ¼ of Sec. 34, T. 16 S., R. 6 W., W. M.	E. J. Kubli Estate, Goldson	99-year lease, expires Aug. 31, 2026	Alternate for 3.6-acre tract
Lincoln	Quarry Site	3.21	Roosevelt Coast Highway near Agate Beach	In NW. ¼ of Sec. 29, T. 10 S., R. 11 W., W. M.	Frank A. Knapp Estate, Portland	Purchase	2,250.00
Lincoln	Quarry Site	6.3	Corvallis-Newport Highway, 1½ miles west of Chitwood	In NW. ¼ of Sec. 6, T. 11 S., R. 9 W., W. M.	E. H. Steinmetz and wife, Chitwood	Purchase	2,000.00

TABLE No. 43—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Lincoln	Quarry Site	1.0	Roosevelt Coast Highway near Yachats	In NE. ¼ of SW. ¼ of Sec. 26, T. 14 S., R. 12 W., W. M.	J. L. Hartley	Purchase	$ 215.00
Lincoln	Quarry Site	1.0	Roosevelt Coast Highway near Yachats	In NE. ¼ of SW. ¼ of Sec. 26, T. 14 S., R. 12 W., W. M.	A. D. Weir, Corvallis	Purchase	175.00
Lincoln	Quarry Site	.....	Roosevelt Coast Highway at Seal Rocks	Lots 11, 12, 13, 14 and S. ½ of 15 of Block 48, Brassfield's Addition to Seal Rocks	Bela Wright and wife, Newport	Purchase	1,200.00
Malheur	Gravel Pit	2.0	John Day Highway, 5 miles east of Vale	In NW. ¼ of SE. ¼ of Sec. 21, T. 18 S., R. 46 E., W. M.	Oregon & Western Colonization Co., St. Paul, Minn.	Purchase	200.00
Malheur	Gravel Pit	2.0	Near John Day Highway, 1½ miles south of Cairo	In SW. ¼ of NW. ¼ of Sec. 30, T. 18 S., R. 47 E., W. M.	Mary J. Hallock, Ontario	Purchase	400.00
Malheur	Filler Pit	1.0	Old Oregon Trail near junction with Payette Spur	In NE. ¼ of SE. ¼ of Sec. 3, T. 17 S., R. 47 E., W. M.	Payette-Oregon Slope Irrigation District, Ontario	Purchase	50.00
Malheur	Gravel Pit	5.362	County Road, ½ miles west of Old Oregon Trail, 3 miles north of Nyssa	In NW. ¼ of NE. ¼ of Sec. 18, T. 19 S., R. 47 E., W. M.	J. C. Fleming and wife, Ontario	Purchase	400.00
Malheur	Gravel Pit	0.675	County Road, ½ mile east of Old Oregon Trail, about 7 miles north of Ontario	In SW. ¼ of SE. ¼ of Sec. 35, T. 16 S., R. 47 E., W. M.	Federal Land Bank of Spokane, Wash.	5-year lease, expires Jan. 4, 1932	125.00
Malheur	Gravel Pit	0.615	Old Oregon Trail, ¾ mile north of Payette Spur Junction	In SE. ¼ of SE. ¼ of Sec. 35, T. 16 S., R. 47 E., W. M.	J. H. Bowers, Payette, Idaho	5-year lease, expires Dec. 1, 1929	100.00
Malheur	Gravel Pit	0.803	Weiser Spur Section, 1 mile north of Old Oregon Trail Junction	In NW. ¼ of NE. ¼ of Sec. 28, T. 15 S., R. 47 E., W. M.	E. E. Record, Weiser, Idaho	10-year lease, expires Dec. 1, 1934	150.00
Malheur	Quarry Site	10.0	John Day Highway, 7 miles east of Ironside	In SE. ¼ of Sec. 33, T. 14 S., R. 40 E., W. M.	Malheur County	Donation	.....
Malheur	Gravel Pit	3.98	John Day Highway in Townsite of Columbine	In Sec. 36, T. 16 S., R. 43 E., W. M.	Malheur County	Donation	.....
Malheur	Gravel Pit	3.53	John Day Highway, 4 miles north of Vale	In N. ½ of NE. ¼ of Sec. 1, T. 18 S., R. 44 E., W. M.	Malheur County	Donation	.....
Malheur	Quarry Site	3.84	John Day Highway, 4½ miles west of Brogan	In SW. ¼ of SW. ¼ of Sec. 16, T. 15 S., R. 42 E., W. M.	Malheur County	Donation	.....
Malheur	Gravel Pit	2.189	John Day Highway, 3 miles east of Vale	In SE. ¼ of NW. ¼ of Sec. 21, T. 18 S., R. 45 E., W. M.	Malheur County	Donation	.....
Malheur	Gravel Pit	11.977	John Day Highway, 3 miles east of Vale	In SW. ¼ of NE. ¼ of Sec. 21, T. 18 S., R. 45 E., W. M.	Chas. E. MacLean and wife, Vale	Purchase	407.94
Malheur	Quarry Site	2.0	John Day Highway near Ironside	In SW. ¼ of NW. ¼ of Sec. 19, T. 14 S., R. 39 E., W. M.	M. and J. Rouse	1-year lease, expired Sept. 1, 1928	100.00
Malheur	Quarry Site	2.0	John Day Highway, about 6 miles east of Bonita	In SW. ¼ of NE. ¼ of Sec. 11, T. 15 S., R. 41 E., W. M.	Eastern Oregon Land Co., Ontario	15-year lease, expires July 15, 1941	200.00

Malheur	Filler Pit	1.0	John Day Highway, about 4 miles west of Bonita	In SE. ¼ of NW. ¼ of Sec. 31, T. 14 S., R. 40 E., W. M.	Eastern Oregon Land Co., Ontario	15-year lease, expires May 23, 1942	25.00
Morrow	Gravel Pit	5.41	Columbia River Highway, 1½ miles east of Irrigon	Lot 4 of Block 24, east of subdivision in NE. ¼ of SW. ¼ of Sec. 20, T. 5 N., R. 27 E., W. M.	F. P. Knopp and wife, Spokane, Wash.	Purchase	400.00
Morrow	Gravel Pit	1.15	Columbia River Highway in the town of Castle Rock	Lots 1 to 6, Block 1; 1 to 8, Block 2, and 3 to 8, Block 4, Townsite of Castle Rock	J. L. and Nell Beckley, Klamath Falls	Purchase	250.00
Morrow	Gravel Pit	5.0	Columbia River Highway, 1½ miles east of Irrigon	Part of Lot 10, Block 24, east of subdivision in S. ½ of Sec. 20, T. 5 N., R. 27 E., W. M.	Ladd Estate Co., Portland	Purchase	250.00
Morrow	Gravel Pit	6.47	Columbia River Highway near town of Boardman	In SE. ¼ of NW. ¼ of Sec. 8, T. 4 N., R. 25 E., W. M.	S. H. Boardman and wife, Boardman	Purchase	150.00
Morrow	Quarry Site	4.99	Oregon-Washington Highway between Lexington and Heppner	In E. ½ of SE. ¼ of Sec. 17, T. 2 S., R. 26 E., W. M.	Adam Blahm and wife, Heppner	Purchase	100.00
Morrow	Quarry Site	6.76	Oregon-Washington Highway, about 4 miles east of Lena	In SW. ¼ of Sec. 22, and in SE. ¼ of Sec. 21, T. 2 S., R. 29 E., W. M.	The Delaware Company, Portland	Purchase	100.00
Morrow	Gravel Pit	80.0	Columbia River Highway near Messner	NW. ¼ of NE. ¼ and NE. ¼ of NW. ¼ of Sec. 10, T. 4 N., R. 25 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Morrow	Gravel Pit	40.0	Columbia River Highway at Mile Post No. 159	NW. ¼ of SW. ¼ of Sec. 20, T. 4 N., R. 23 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Morrow	Gravel Pit	40.0	Columbia River Highway at Mile Post No. 180	N. ½ of NE. ¼ of NW. ¼ and N. ½ of NW. ¼ of NE. ¼ of Sec. 28, T. 5 N., R. 26 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Morrow	Quarry Site	7.89	Oregon-Washington Highway at Morgan	In SE. ¼ of NE. ¼ of Sec. 22, T. 1 N., R. 23 E., W. M.	J. F. Hardesty and wife, Morgan	Purchase	200.00
Morrow	Quarry Site	4.72	Oregon-Washington Highway, about 4 miles west of Lena	In NW. ¼ of NE. ¼ of Sec. 13, T. 2 S., R. 28 E., W. M.	A. Percy Hughes and wife, Freewater	Purchase	100.00
Morrow	Quarry Site	2.36	Oregon-Washington Highway near Ewing	In SE. ¼ of SE. ¼ of Sec. 6, T. 2 N., R. 23 E., W. M.	John McIntire and wife, Wallowa	Purchase	35.00
Morrow	Quarry Site	1.827	Oregon-Washington Highway, about 3 miles east of Ione	In NW. ¼ of NE. ¼ of Sec. 11, T. 1 S., R. 24 E., W. M.	L. McMurray and wife, Ione	Purchase	75.00
Morrow	Quarry Site	2.36	Oregon-Washington Highway near Ewing	In NE. ¼ of NE. ¼ of Sec. 7, T. 2 N., R. 23 E., W. M.	W. V. Pedro and wife	Purchase	35.00
Morrow	Gravel Pit	5.34	Old Oregon Trail near Irrigon	In NW. ¼ of SE. ¼ of Sec. 20, T. 5 N., R. 27 E., W. M.	W. R. Walpole and wife, Irrigon	Purchase	250.00
Polk	Quarry Site	3.15	McMinnville-Tillamook Highway at Gold Creek, 8 miles west of Sheridan	In SE. ¼ of Sec. 21, T. 6 S., R. 7 W., W. M.	Mary E. Everett and husband, Portland	20-year lease, expires April 14, 1947	1,000.00
Polk	Gravel Pit	5.11	McMinnville-Tillamook Highway between Willamina and Grand Ronde	In NW. ¼ of Sec. 8, T. 6 S., R. 7 W., W. M.	Walter W. Werth and wife, Grand Ronde	5-year lease, expires July 1, 1932	250.00

TABLE No. 43—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Sherman	Gravel Pit	5.0	Columbia River Highway near John Day River	In Sec. 23, T. 3 N., R. 17 E., W. M.	C. C. Deyo and wife, Rufus	Purchase	$ 500.00
Sherman	Quarry Site	4.3	Sherman Highway near Finnegan Creek	In Sec. 31, T. 3 S., R. 17 E., W. M.	Eastern Oregon Land Co., Moro	Exchange of property	.....
Sherman	Quarry Site	5.0	Sherman Highway, ½ mile north of Grass Valley	In NW. ¼ of NE. ¼ of Sec. 26, T. 2 S., R. 16 E., W. M.	A. L. Russell and wife	10-year lease, expires April 30, 1938	250.00
Tillamook	Gravel Pit	3.86	Roosevelt Coast Highway at Miami River	In NW. ¼ of NE. ¼ of Sec. 14, T. 1 N., R. 10 W., W. M.	Chas. Blum, Garibaldi	2-year lease, expires June 16, 1929	350.00
Tillamook	Gravel Pit	4.1	Roosevelt Coast Highway at Nestucca River	In E. ½ of Sec. 1, T. 4 S., R. 10 W., W. M.	Herman M. Farmer and wife	Purchase	700.00
Tillamook	Quarry Site	.....	Near McMinnville-Tillamook Highway at Cedar Creek	In NW. ¼ of SE. ¼ of Sec. 24, T. 4 S., R. 10 W., W. M.	U. S. Forest Service	Special use permit	.....
Tillamook	Borrow Pit	1.03	Roosevelt Coast Highway near Mohler	In NE. ¼ of Sec. 35, T. 3 N., R. 10 W., W. M.	Geo. E. Olds, Tillamook	Agreement	10.00
Umatilla	Filler Pit	2.0	Old Oregon Trail at the Furnish Reservoir, 8 miles west of Rieth	2 tracts in SW. ¼ of SE. ¼ of Sec. 1, T. 2 N., R. 30 E., W. M.	Christopher Stanull, Nolin	Purchase	100.00
Umatilla	Quarry Site	3.8	Old Oregon Trail, 9 miles east of Pendleton	In NW. ¼ of SE. ¼ of Sec. 25, T. 2 N., R. 33 E., W. M.	Gottlop Schwank and wife, Walla Walla, Wash.	Purchase	125.00
Umatilla	Quarry Site	2.38	Old Oregon Trail, ½ mile west of Meacham	In NW. ¼ of NE. ¼ of Sec. 3, T. 1 S., R. 35 E., W. M.	Earl Gillanders and wife, Meacham	Purchase	400.00
Umatilla	Binder Pit	2.25	Old Oregon Trail, 1½ miles east of Hermiston	In NE. ¼ of NW. ¼ of Sec. 13, T. 4 N., R. 28 E., W. M.	Inland Irrigation Co., Tacoma, Wash.	Purchase	150.00
Umatilla	Quarry Site	3.05	Old Oregon Trail, 1½ miles west of Hermiston	In SW. ¼ of NW. ¼ of Sec. 3, T. 4 N., R. 28 E., W. M.	Frank L. Metz, Hermiston	Purchase	95.00
Umatilla	Quarry Site	2.81	Pendleton-John Day Highway, 4 miles south of Nye	In NW. ¼ of SW. ¼ of Sec. 6, T. 2 S., R. 31 E., W. M.	Newton McCoy and wife, Portland	Purchase	225.00
Umatilla	Quarry Site	1.85	Old Oregon Trail at Deadman's Hill	In SW. ¼ of NE. ¼ of Sec. 2, T. 1 N., R. 34 E., W. M.	Willie Williams (Indian), Pendleton	Purchase	112.50
Umatilla	Filler Pit	0.58	Old Oregon Trail, 3 miles east of Umatilla	In SE. ¼ of SW. ¼ of Sec. 28, T. 5 N., R. 28 E., W. M.	Karl Schachermeyer and wife, Umatilla	Purchase	116.00
Umatilla	Filler Pit	0.26	Old Oregon Trail at Deadman's Pass	In Sec. 1, T. 1 N., R. 34 E., W. M.	Bertha Martin (Indian), Pendleton	5-year lease, expires Sept. 9, 1930	25.00
Umatilla	Quarry Site	2.0	1 mile east of Old Oregon Trail at Echo	In NE. ¼ of NW. ¼ of Sec. 15, T. 3 N., R. 29 E., W. M.	James Bottger, Pendleton	20-year lease, expires May 17, 1944	100.00
Umatilla	Filler Pit	1.01	Old Oregon Trail, 12 miles east of Pendleton	2 tracts in NW. ¼ of NW. ¼ of Sec. 6, T. 1 N., R. 34 E., W. M.	Elizabeth Badroads (Indian), Pendleton	5-year lease, expires Sept. 9, 1930	101.00
Umatilla	Quarry Site	2.23	Old Oregon Trail, 12 miles east of Pendleton	In NE. ¼ of NW. ¼ of Sec. 6, T. 1 N., R. 34 E., W. M.	Elizabeth Badroads (Indian), Pendleton	Lease, expires Sept. 9, 1930	111.50
Umatilla	Filler Pit	2.0	Old Oregon Trail, 12 miles east of Pendleton	In Lot 2, Sec. 31, T. 2 N., R. 34 E., W. M.	Maurine Campbell (Indian), Pendleton	5-year lease, expires Aug. 1, 1930	200.00
Umatilla	Binder Pit	0.84	Old Oregon Trail, 15 miles east of Pendleton at summit of Cabbage Hill	In SW. ¼ of SE. ¼ of Sec. 5, T. 1 N., R. 34 E., W. M.	Rachel Eva Van Pelt (Indian), Pendleton	5-year lease, expires June 30, 1930	84.00

Umatilla	Quarry Site	5.05	Oregon-Washington Highway, 3 miles west of Vinson	In SE. ¼ of NW. ¼ of Sec. 31, T. 1 S., R. 30 E., W. M.	A. A. Cole, Pendleton	20-year lease, expires Dec. 10, 1946	100.00
Umatilla	Binder Pit	.....	Old Oregon Trail, 6 miles east of Echo	In NE. ¼ of Sec. 36, T. 3 N., R. 29 E., W. M.	Flor Queener, Echo	10-year lease, expires Feb. 22, 1934	50.00
Umatilla	Quarry Site	0.75	County Road, ½ mile northwest of Oregon-Washington Highway near Adams	In SW. ¼ of NE. ¼ of Sec. 34, T. 4 N., R. 34 E., W. M.	R. W. Allen and wife	Purchase	150.00
Umatilla	Quarry Site	1.0	Old Oregon Trail at Meacham	In NW. ¼ of NE. ¼ of Sec. 3, T. 1 S., R. 35 E., W. M.	Earl Gillanders, Meacham	Purchase	100.00
Umatilla	Quarry Site	42.81	Old Oregon Trail near Hermiston	NW. ¼ of NW. ¼ of Sec. 3, T. 4 N., R. 28 E., W. M.	Northern Pacific Railroad Co.	Purchase	428.10
Umatilla	Gravel Pit	2.79	Oregon-Washington Highway near Milton	In SE. ¼ of NW. ¼ of Sec. 35, T. 5 N., R. 35 E., W. M.	J. Marvin Price et al.	1-year lease, expires June 1, 1929	100.00
Umatilla	Gravel Pit	3.64	Old Oregon Trail at Mile Post No. 216	In NW. ¼ of NW. ¼ of Sec. 10, and in NE. ¼ of NE. ¼ of Sec. 9, T. 2 N., R. 30 E., W. M.	C. J. Spencer and wife	5-year lease, expires Aug. 2, 1933	100.00
Umatilla	Quarry Site	1.96	Old Oregon Trail at Meacham	In Lot 8 of Sec. 34, T. 1 N., R. 35 E., W. M.	J. E. Smith Livestock Co., Meacham	Purchase	196.00
Umatilla	Quarry Site	7.98	Old Oregon Trail	In S. ½ of NW. ¼ of Sec. 15, T. 2 N., R. 31 E., W. M.	James H. Sturgis and wife	Purchase	250.00
Umatilla	Quarry Site	3.96	Old Oregon Trail in Umatilla Indian Reservation	In SE. ¼ of SE. ¼ of Sec. 4, T. 1 N., R. 34 E., W. M.	Wapona (Indian), Umatilla	Purchase	218.00
Umatilla	Quarry Site	1.577	Pendleton-John Day Highway near Lazinka Ranch	In SE. ¼ of NW. ¼ of Sec. 29, T. 3 S., R. 31 E., W. M.	Cunningham Sheep and Land Co.	Purchase	39.43
Umatilla	Quarry Site	3.695	Pendleton-John Day Highway near Lazinka Ranch	In SE. ¼ of NW. ¼ of Sec. 29, T. 3 S., R. 31 E., W. M.	Fred W. Falconer and wife	Purchase	92.38
Umatilla	Quarry Site	4.27	Pendleton-John Day Highway near Lazinka Ranch	In SE. ¼ of SE. ¼ of Sec. 12, T. 3 S., R. 30½ E., W. M.	Fred W. Falconer and wife	Purchase	106.75
Umatilla	Gravel Pit	2.8	Old Oregon Trail, 5 miles east of Pendleton	In NW. ¼ of SW. ¼ of Sec. 11, T. 2 N., R. 33 E., W. M.	Umatilla Indian Reservation	5-year lease	Furnish gravel for mission grounds
Umatilla	Gravel Pit	.....	Old Oregon Trail in Town of Echo	In SE. ¼ of NW. ¼ of Sec. 16, T. 3 N., R. 29 E., W. M.	John Vert, Pendleton	Purchase	100.00
Union	Filler Pit	0.46	Old Oregon Trail, ½ mile east of Hot Lake	In SE. ¼ of NW. ¼ of Sec. 9, T. 4 S., R. 39 E., W. M.	Walter M. Pierce, Salem	10-year agreement, expires Aug. 4, 1934	25.00
Union	Filler Pit	1.73	Old Oregon Trail, 3 miles east of Kamela	In NE. ¼ of Sec. 7, T. 2 S., R. 36 E., W. M.	J. E. Smith Livestock Co., La Grande	5-year lease, expires June 8, 1931	25.00
Union	Quarry Site	2.81	Old Oregon Trail. 2 miles south of Union	In NW. ¼ of SW. ¼ of Sec. 31, T. 4 S., R. 40 E., W. M.	A. B. Hempe, Union	20-year lease, expires Mar. 10, 1944	150.00
Union	Filler Pit	0.6	Old Oregon Trail, 3 miles south of Union	In SW. ¼ of NW. ¼ of Sec. 6, T. 5 S., R. 40 E., W. M.	M. W. Huffman and wife, La Grande	Purchase	100.00
Union	Quarry Site	4.84	Old Oregon Trail, 3 miles north of North Powder	In NE. ¼ of NW. ¼ of Sec. 12, T. 6 S., R. 39 E., W. M.	H. C. Bidwell and wife, La Grande	Condemnation	1,500.00

TABLE No. 43—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Union	Quarry Site	6.33	Near Old Oregon Trail, ½ mile east of Hot Lake	In NW. ¼ of NW. ¼ of Sec. 9, T. 4 S., R. 39 E., W. M.	Security Land & Savings Co., La Grande	Purchase	$ 316.50
Union	Quarry Site	2.95	Old Oregon Trail, ½ mile west of La Grande	In E. ½ of SE. ¼ of Sec. 36, T. 2 S., R. 37 E., W. M.	S. V. Evans and wife, La Grande	Purchase	50.00
Union	Gravel Pit	4.27	Old Oregon Trail near North Powder	In NE. ¼ of SW. ¼ and SE. ¼ of NW. ¼ of Sec. 14, T. 6 S., R. 39 E., W. M.	L. M. Daugherty and wife	Purchase	427.00
Union	Gravel Pit	2.0	La Grande-Wallowa Lake Highway in Town of Elgin	In SE. ¼ of SE. ¼ of Sec. 15, T. 1 N., R. 39 E., W. M.	Miss Mary L. Elliott, Elgin	Purchase	100.00
Union	Gravel Pit	4.54	La Grande-Wallowa Lake Highway near Minam	In NE. ¼ of NE. ¼ of Sec. 31, T. 2 N., R. 41 E., W. M.	Minam Lumber Co., La Grande	1-year lease, expired Oct. 6, 1928	100.00
Union	Quarry Site	2.55	La Grande-Wallowa Lake Highway, about 4 miles west of Minam	In SW. ¼ of SW. ¼ of Sec. 3, T. 1 N., R. 40 E., W. M.	F. L. Wade and wife	Purchase	150.00
Wallowa	Gravel Pit	0.75	La Grande-Wallowa Lake Highway, 4 miles east of Wallowa	In SW. ¼ of Sec. 29, and SE. ¼ of Sec. 30, T. 1 N., R. 43 E., W. M.	Neal Baker, Wallowa	10-year lease, expires May 31, 1935	75.00
Wallowa	Quarry Site	1.17	Enterprise-Flora Highway, 11 miles north of Enterprise	In NE. ¼ of NE. ¼ of Sec. 13, T. 1 N., R. 44 E., W. M.	Clyde Sanders and wife, Enterprise	Purchase	117.00
Wallowa	Filler Pit	1.21	Enterprise-Flora Highway, 11 miles north of Enterprise	In NE. ¼ of NE. ¼ of Sec. 13, T. 1 N., R. 44 E., W. M.	Clyde Sanders and wife, Enterprise	Purchase	121.00
Wallowa	Quarry Site	1.59	Near Enterprise-Flora Highway, 4 miles north of Enterprise	In NE. ¼ of NE. ¼ of Sec. 14, T. 1 S., R. 44 E., W. M.	Hattie Patterson, Enterprise	Purchase	350.00
Wallowa	Quarry Site	3.76	La Grande-Wallowa Lake Highway, 5 miles west of Minam	In NE. ¼ of SE. ¼ of Sec. 31, T. 2 N., R. 42 E., W. M.	E. F. Johnson, Enterprise	5-year lease, expires Nov. 1, 1931	1.00
Wallowa	Quarry Site	6.0	La Grande-Wallowa Lake Highway near Lostine	In SE. ¼ of SE. ¼ of Sec. 10, T. 1 S., R. 43 E., W. M.	Jay Lewis and wife, Lostine	Purchase	450.00
Wallowa	Gravel Pit	1.5	County Road near La Grande-Wallowa Lake Highway near Wallowa	In SE. ¼ of NW. ¼ of Sec. 4, T. 1 N., R. 42 E., W. M.	J. A. McCullough	5-year lease expires Nov. 18, 1932	150.00
Wallowa	Quarry Site	3.06	La Grande-Wallowa Lake Highway, about 4 miles west of Enterprise	In SE. ¼ of NW. ¼ of Sec. 33, T. 1 S., R. 44 E., W. M.	Hugh Laird	Purchase	60.00
Wallowa	Gravel Pit	1.64	La Grande-Wallowa Lake Highway near Town of Enterprise	In NW. ¼ of NW. ¼ of Sec. 2, T. 2 S., R. 44 E., W. M.	Byron F. Miller	Purchase	100.00
Wallowa	Quarry Site	1.43	La Grande-Wallowa Lake Highway near Wallowa	In SE. ¼ of SW. ¼ of Sec. 13, T. 1 N., R. 42 E., W. M.	James Noregaard and wife	Condemnation	968.50

Wallowa	Filler Pit	1.88	County Road near La Grande-Wallowa Lake Highway near Town of Wallowa	In Sec. 6, T. 1 S., R. 43 E., W. M.	Jesse Allen	5-year lease, expires Dec. 30, 1931	125.00
Wallowa	Filler Pit	1.08	Enterprise-Flora Highway, about 7 miles north of Enterprise	In NW. ¼ of SW. ¼ of Sec. 36, T. 1 N., R. 44 E., W. M.	The Oregon Mortgage Co., Ltd., Spokane, Wash.	Purchase	100.00
Wallowa	Filler Pit	1.5	La Grande-Wallowa Lake Highway near Lostine	In SE. ¼ of NE. ¼ of Sec. 14, T. 1 S., R. 43 E., W. M.	W. W. Wade and wife, Island City	5-year lease, expires July 1, 1932	150.00
Wallowa	Filler Pit	0.5	Maxwell County Road near La Grande-Wallowa Lake Highway near Wallowa	In SW. ¼ of NW. ¼ of Sec. 27, T. 2 N., R. 42 E., W. M.	Jacob Winehard, Wallowa	5-year lease, expires May 16, 1932	50.00
Wasco	Filler Pit	3.27	The Dalles-California Highway, 1½ miles north of Sherman Highway Junction	In NW. ¼ of NW. ¼ of Sec. 29, T. 7 S., R. 15 E., W. M.	Otto Herrling, Criterion	Purchase	66.00
Wasco	Filler Pit	2.0	The Dalles-California Highway, 2 miles north of Tygh Valley	In SW. ¼ of NW. ¼ of Sec. 33, T. 3 S., R. 13 E., W. M.	Alexander Ross, Tygh Valley	Purchase	300.00
Wasco	Quarry Site	3.19	The Dalles-California Highway in Cow Canyon	In SW. ¼ of NW. ¼ of Sec. 15, T. 8 S., R. 15 E., W. M.	John E. Conroy, Madras	1-year lease, expired Feb. 2, 1928	75.00
Wasco	Quarry Site	10.0	The Dalles-California Highway at Mile Post No. 56	In NE. ¼ of SW. ¼ of Sec. 11, T. 6 S., R. 14 E., W. M.	W. E. Hunt, Maupin	Permit	.....
Wasco	Quarry Site	3.58	The Dalles-California Highway between Dufur and Cow Canyon	In NE. ¼ of NW. ¼ of Sec. 33, T. 3 S., R. 13 E., W. M.	Ellen J. Miller and husband, Tygh Valley	Purchase	212.50
Wasco	Gravel Pit	6.47	Wapinitia Highway, about 5 miles west of Wapinitia	In N. ½ of NW. ¼ of Sec. 30, T. 5 S., R. 12 E., W. M.	Wapinitia Irrigation Co., Portland	Purchase	650.00
Wasco	Quarry Site	.....	The Dalles-California Highway at Maupin	SW. ¼ of SW. ¼ of Sec. 33, T. 4 S., R. 14 E., W. M.	U. S. Government	Sec. 17 of Federal Highway Act	.....
Wasco	Gravel Pit	.....	Columbia River Highway near Deschutes River	In NW. ¼ of NE. ¼ of Sec. 27, T. 2 N., R. 15 E., W. M.	O.-W. R. & N. Co. and W. H. Carlisle, The Dalles	Easement	.....

TABLE No. 44

LIST OF MAINTENANCE PATROL STATION SITES, SHOP SITES AND MISCELLANEOUS OTHER REAL PROPERTY OWNED OR HELD UNDER LEASE BY THE STATE HIGHWAY COMMISSION

November 30, 1928

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Benton	Patrol Station Site	0.5	Alsea Highway, 6½ miles south of Philomath	In NW. ¼ of NE. ¼ of Sec. 6, T. 13 S., R. 6 W., W. M.	Alice L. White, Corvallis	99-year lease, expires Jan. 21, 2025	$ 50.00
Benton	Maintenance Quarters Site	.....	West Side Pacific Highway in Corvallis	Lot 10 of Block "A," Avery's Addition to Corvallis	Leanna Avery and husband, Corvallis	Purchase	375.00
Benton	Maintenance Quarters Site	.....	West Side Pacific Highway in Corvallis	Lot 11 of Block "A," Avery's Addition to Corvallis	A. J. Bier	Purchase	350.00
Benton	Maintenance Quarters Site	.....	West Side Pacific Highway in Corvallis	Lot 12 of Block "A," Avery's Addition to Corvallis	Stephen Carver and wife, Carver	Purchase	200.00
Clackamas	Scales Site	0.124	Pacific Highway in Town of Canemah	Lot 5 and part of Lot 4 of Block "A," Canemah	Portland Electric Power Co., Portland	Purchase	500.00
Clackamas	Maintenance Quarters Site	0.115	Mt. Hood Highway at Government Camp	Lot 7 of Block 5, townsite of Pompeii	Albert A. Broetje, Yakima, Wash.	Purchase	150.00
Clackamas	Maintenance Quarters Site	0.115	Mt. Hood Highway at Government Camp	Lot 8 of Block 5, townsite of Pompeii	Mary K. Ott Bofinger and husband, Portland	Purchase	200.00
Clackamas	Maintenance Quarters Site	0.452	Mt. Hood Highway at Sandy	Lots 4 and 5 of Block 1, town of Sandy, and other property	Emma Vesti Miller, Sandy	Purchase	625.00
Clatsop	Channel Change	0.16	Columbia River Highway at Bear Creek	In Sec. 22, T. 8 N., R. 8 W., W. M.	Nancy Fisher, Portland	Perpetual easement	50.00
Coos	Shops Site	1.44	Roosevelt Coast Highway in Coquille	In Lot 7 of Sec. 1, T. 28 S., R. 13 W., W. M.	W. L. Kistner, Coquille	Purchase	2,000.00
Coos	Shops Site	0.33	Roosevelt Coast Highway in Coquille	In Lot 7 of Sec. 1, T. 28 S., R. 13 W., W. M.	J. A. Collier Estate, Coquille	Purchase	1,800.00
Coos	Channel Change	11.48	Near Roosevelt Coast Highway at Douglas Co. Line	In Sec. 1, T. 23 S., R. 13 W., and in Sec. 6, T. 23 S., R. 12 W., W. M.	Stout Lumber Co., Marshfield	Perpetual easement	.....
Crook	Maintenance Quarters Site	.....	Ochoco Highway in Prineville	Lots 5 and 6 of Block 3, Johnson's Addition to Prineville	William B. Morse and wife, Prineville	Purchase	375.00
Deschutes	Maintenance Quarters Site	.....	The Dalles-California Highway in Bend	NE. ¼ of Block 32 of Lytle Acreage at Bend	W. C. McCuiston and wife, Medford	Purchase	1,000.00
Douglas	Dike Site	0.33	Pacific Highway, 1 mile south of Yoncalla	In NE. ¼ of SW. ¼ of Sec. 10, T. 23 S., R. 5 W., W. M.	C. E. Wise Estate, Yoncalla	Perpetual easement	50.00
Grant	Patrol Station Site	6.04	John Day Highway near Austin	In NE. ¼ of Sec. 33, and NW. ¼ of Sec. 34, T. 11 S., R. 35 E., W. M.	U. S. Forest Service	Special use permit, expires Dec. 3, 1928	.....
Hood River	Slope Protection	1.49	Columbia River Highway at Hood River Loops	In SW. ¼ of Sec. 30, and NW. ¼ of Sec. 31, T. 3 N., R. 11 E., W. M.	Ethel P. Button, Hood River	Purchase	300.00

Hood River	Slope Protection	2.86	Columbia River Highway at Hood River Loops	In SW. ¼ of Sec. 30, and NW. ¼ of Sec. 31, T. 3 N., R. 11 E., W. M.	V. T. Beauregard and wife, Hood River	Purchase	1,500.00
Hood River	Slope Protection	0.34	Columbia River Highway at Hood River Loops	In NW. ¼ of NW. ¼ of Sec. 31, T. 3 N., R. 11 E., W. M.	Don Ellsworth Dean, Hood River	Purchase	745.00
Jackson	Maintenance Quarters Site	7.00	Pacific Highway near Siskiyou Station	In SE. ¼ of SE. ¼ of Sec. 20, T. 40 S., R. 2 E., W. M.	J. A. Edwards, Ashland	Purchase	500.00
Jackson	Maintenance Quarters Site	1.00	Ashland-Klamath Falls Highway, about 7 miles west of Pinehurst	In SW. ¼ of NW. ¼ of Sec. 3, T. 40 S., R. 3 E., W. M.	Jacob P. Timmerman, Medford	Purchase	125.00
Klamath	Shops Site	3.23	The Dalles-California Highway, 1 mile east of Klamath Falls	Is SE. ¼ of Sec. 3, T. 39 S., R. 9 E., W. M.	The Nedra Co., Klamath Falls	Purchase	1,615.00
Klamath	Maintenance Quarters Site	1.26	The Dalles-California Highway at Chemult	In NE. ¼ of NE. ¼ of Sec. 20, T. 27 S., R. 8 E., W. M.	U. S. Forest Service	Special use permit, expires Nov. 1, 1929	.....
Klamath	Maintenance Quarters Site	2.09	The Dalles-California Highway at Sand Creek	In NW. ¼ of NW. ¼ of Sec. 29, T. 31 S., R. 7 E., W. M.	Violet Smith Estate	Purchase	220.00
Lake	Patrol Station Site	0.59	Fremont Highway at Paisley	SE. corner of Main and Cottonwood Streets	C. F. Snider and wife, Paisley	Purchase	100.00
Lake	Maintenance Quarters Site	.....	Near Fremont Highway in Lakeview	Lots 10 and 11 of Walters Second Addition to Lakeview	B. J. Crowley and wife, Lakeview	Purchase	1,550.00
Lane	Maintenance Quarters Site	3.47	Siuslaw Highway between Blachly and Cheshire	In SE. ¼ of SE. ¼ of Sec. 27, T. 16 S., R. 6 W., W. M.	E. J. Kubli Estate	Purchase	500.00
Lincoln	Maintenance Quarters Site	1.10	Corvallis-Newport Highway near Benton County Line	In NW. ¼ of Sec. 24, T. 11 S., R. 8 W., W. M.	Archer O. Leech, Portland	Purchase	100.00
Linn	Dike Site	4.87	One-half mile east of Pacific Highway, 1 mile south of Jefferson	In SW. ¼ of NE. ¼ of Sec. 14, T. 10 S., R. 3 W., W. M.	Roscoe G. Ashley and wife, Portland	Purchase	687.00
Linn	Dike Site	11.00	Near Pacific Highway, 1 mile south of Jefferson	In Sec. 14, T. 10 S., R. 3 W., W. M.	Claus Thiessen, Jefferson	Perpetual easement	1.00
Linn	Dike Site	2.83	Near Pacific Highway, 1 mile south of Jefferson	In Sec. 14, T. 10 S., R. 3 W., W. M.	Henry Ammon and wife, Jefferson	Perpetual easement	1.00
Malheur	Patrol Station Site	3.00	Old Oregon Trail at junction with Porter's private ferry road	In NW. ¼ of SW. ¼ of Sec. 17, T. 15 S., R. 46 E., W. M.	O. W. Porter and wife, Ontario	Purchase	150.00
Malheur	Patrol Station Site	.....	Old Oregon Trail in town of Ontario	Lots 1, 2, 3, 4 and 5 of Block 43, town of Ontario	City of Ontario	Purchase	676.75
Sherman	Patrol Station Site	0.23	Columbia River Highway in town of Rufus	Lots 4 and 5 of Block 19, townsite of Rufus	Herbert Hill and wife, Cabazon, Cal.	Purchase	150.00
Tillamook	Channel Change	0.164	Roosevelt Coast Highway at Christensen Slough near Bay City	In SE. ¼ of NE. ¼ of Sec. 12, T. 1 S., R. 10 W., W. M.	John Hathaway and wife	Perpetual easement	325.00
Tillamook	Maintenance Quarters Site	0.25	McMinnville-Tillamook Highway at Hebo	In Sec. 13, T. 4 S., R. 10 W., W. M.	Hugh Arstill et al.	Purchase	825.00
Umatilla	Maintenance Quarters Site	0.805	Old Oregon Trail at Meacham	Lots 2, 3, 4, 9, 10, 11 and 12, Block 4, townsite of Etna	Earl Gillanders and wife, Meacham	Purchase	500.00
Umatilla	Maintenance Quarters Site	0.115	Old Oregon Trail at Meacham	Lot 1 of Block 4, townsite of Etna	Umatilla County Court, Pendleton	Gift	.....

TABLE No. 44—Continued

County	Purpose for Which Acquired	Area in Acres	Approximate Location	Legal Description	From Whom Acquired	How Acquired	Consideration
Umatilla	Maintenance Quarters Site	0.414	Oregon-Washington Highway at Athena	Lots 10, 11 and 12 of Block 5, original townsite of Athena	Athena City Council, Athena	Gift	.....
Umatilla	Patrol Headquarters	.....	Old Oregon Trail, 1 mile east of Pendleton	Part of "Chisholm Place on Riverside," in Sec. 1, T. 2 N., R. 32 E., W. M.	J. J. Chisholm	1-year lease, expires March 15, 1929	.....
Union	Snow Fence Site	3.64	Old Oregon Trail, 3½ miles south of Union	In SW. ¼ of Sec. 6, and NW. ¼ of Sec. 7, T. 5 S., R. 40 E., W. M.	M. W. Huffman and wife, Union	Purchase	455.00
Union	Shops Site	.....	Near Old Oregon Trail in city of La Grande	Tract "U" of Coggans Second Addition and Block 12 of Honan's Addition to La Grande	City of La Grande	Purchase	2,500.00
Wheeler	Patrol Station Site	0.92	John Day Highway, about 3 miles south of Kimberly	In NE. ¼ of Sec. 7, T. 11 S., R. 26 E., W. M.	George Moore	5-year lease, expires May 10, 1931	50.00
Yamhill	Maintenance Quarters Site	.....	McMinnville-Tillamook Highway in Willamina	Lot 1 of Block 3 of Kershaw's Addition to Willamina	R. S. Miller and wife, Willamina	Purchase	150.00

TABLE No. 45

VOLUME OF TRAVEL TO CRATER LAKE AND OREGON CAVES

As an index to the rate at which travel over the Crater Lake Highway and the Redwood Highway is increasing, the following tabulations of yearly registrations at Crater Lake National Park and at the Oregon Caves are given. The information pertaining to Crater Lake National Park was furnished by the U. S. National Park Service, and that pertaining to the Oregon Caves was furnished by the Grants Pass Chamber of Commerce.

CRATER LAKE NATIONAL PARK

YEAR	Cars Registered	Visitors Registered
1904	Not listed	1,400
1905	Not listed	1,400
1906	Not listed	1,800
1907	Not listed	2,600
1908	Not listed	5,275
1909	Not listed	5,000
1910	Not listed	5,000
1911	Not listed	4,500
1912	Not listed	5,235
1913	Not listed	6,235
1914	Not listed	7,096
1915	Not listed	11,371
1916	2,649	12,265
1917	2,756	11,645
1918	3,105	13,231
1919	4,637	16,645
1920	5,158	20,135
1921	7,892	28,617
1922	9,429	33,011
1923	15,377	52,017
1924	19,331	64,312
1925	19,551	65,018
1926	26,397	86,019
1927	25,667	82,354
1928	34,869	113,323

OREGON CAVES

YEAR	Number of Visitors
1922	10,000
1923	14,500
1924	16,500
1925	13,670
1926	20,950
1927	20,442
1928	24,815

TABLE No. 46

RECAPITULATION OF TRAFFIC COUNTS MADE BY THE STATE HIGHWAY DEPARTMENT DURING THE YEARS 1927 AND 1928

The numbers given in this table are the numbers of vehicles of all kinds passing the observation points listed between the hours of 6:00 a. m. and 10:00 p. m. on the dates stated in the column headings. A blank in a column opposite any particular observation point signifies that no count of the traffic at that point was made on that date.

Highway and Observation Point	June 15, 1927. Wednesday	July 14, 1927. Thursday	Aug. 12, 1927. Friday	Sept. 17, 1927. Saturday	Oct. 16, 1927. Sunday	June 13, 1928. Wednesday	July 12, 1928. Thursday	Aug. 17, 1928. Friday	Sept. 15, 1928. Saturday	Oct. 14, 1928. Sunday
PACIFIC HIGHWAY										
North of Junction with County Road south of Oswego	3,506	3,185	3,334	3,604	5,387	3,041	3,314	3,891	3,870	4,018
On County Road at Junction south of Oswego	1,064	906	934	762	1,533	715	958	806	787	821
South of Junction with County Road south of Oswego	2,446	2,389	2,512	3,028	4,031	2,429	2,540	3,195	3,143	3,258
East Side River Road north of Oregon City	2,693	2,625	2,644	2,664	3,535	2,133	2,568	2,251	2,448	2,556
82d Street Road north of Oregon City	2,696	3,394	2,747	3,255	5,176	2,736	2,821	2,765	3,331	3,979
Parkplace Bridge north of Oregon City	4,685	5,179	4,647	5,265	7,549	4,279	4,549	4,338	5,206	5,781
North of Junction with County Road north of Aurora	2,649	2,725	2,773	3,364	4,752	2,601	2,630	2,947	3,107	3,400
On County Road at Junction with County Road north of Aurora	140	79	138	141	132	107	90	137	121	135
South of Junction with County Road north of Aurora	2,767	2,796	2,893	3,497	4,862	2,697	2,708	3,064	3,223	3,516
Santiam River Bridge at Jefferson	1,840	2,023	2,199	2,394	3,196	1,998	2,260	2,308	2,673	2,575
Harrisburg Bridge	1,215	1,442	1,513	1,369	1,660	1,268	1,592	1,549	1,418	1,356
North of Junction with West Side Highway at Junction City	1,469	1,398	1,276	1,212	1,207	967	1,808	1,112	1,819	1,651
South of Junction with West Side Highway at Junction City	2,836	2,359	2,257	2,197	1,961	1,863	3,376	1,845	3,627	3,179
North of Junction with Willamette Highway at Goshen	2,059	2,481	2,512	2,348	2,595	2,177	2,581	2,623	2,475	2,402
South of Junction with Willamette Highway at Goshen	1,721	2,142	2,137	1,926	2,136	1,908	2,198	2,149	1,970	1,967
Yoncalla	1,337	1,804	1,572	1,317	1,174	1,325	1,635	1,567	1,358	1,134
North of Junction with Coos Bay Highway at Winston	1,407	1,742	1,807	1,634	1,136	1,457	1,704	2,204	1,530	1,211
South of Junction with Coos Bay Highway at Winston	1,208	1,548	1,597	1,369	911	1,149	1,456	1,893	1,219	923
One mile south of Wolf Creek	1,084	1,403	1,313	934	705	1,116	1,449	1,290	901	738
North of Junction with Redwood Highway south of Grants Pass	3,093	3,221	3,293	3,098	2,345	3,127	3,214	3,457	3,068	2,635
South of Junction with Redwood Highway south of Grants Pass	1,726	1,968	1,983	1,691	1,443	1,675	1,752	2,093	1,465	1,605
One mile south of Medford	2,871	3,003	3,513	3,505	3,112	3,358	3,018	3,753	3,921	2,984
North of Junction with Ashland-Klamath Falls Highway	1,179	1,390	1,410	1,259	1,431	1,314	1,458	1,444	1,385	1,118
South of Junction with Ashland-Klamath Falls Highway	905	1,167	1,191	922	1,020	1,026	1,210	1,143	1,010	684
COLUMBIA RIVER HIGHWAY										
Clatsop-Columbia County Line	882	933	1,210	1,138	1,084	833	967	1,281	1,020	818
Columbia-Multnomah County Line	1,444	1,464	1,807	2,039	5,357	1,519	1,670	1,910	2,090	2,668
One mile west of Cascade Locks	1,520	1,741	1,785	1,749	2,459	1,653	1,890	2,018	1,996	2,321
West of Junction with Mt. Hood Loop near Hood River	2,172	2,230	2,342	2,837	2,888	2,268	2,641	2,617	3,528	3,045

East of Junction with Mt. Hood Loop near Hood River	1,339	1,380	1,414	1,508	1,546	1,349	1,918	1,707	1,602	1,378
Two miles west of The Dalles, Chenoweth Creek	1,305	1,406	1,481	1,524	1,667	1,428	1,599	1,631	1,447	1,592
West of Junction with The Dalles-California Highway near Seufert	1,581	1,764	1,719	1,875	1,655	1,654	1,923	2,060	1,941	1,680
East of Junction with The Dalles-California Highway near Seufert	1,138	1,212	1,143	1,317	1,083	1,224	1,323	1,379	1,300	1,073
West of Junction with Sherman Highway at Biggs	963	1,065	1,060	1,118	414	925	1,204	1,229	1,033	863
East of Junction with Sherman Highway at Biggs	890	944	958	1,040	347	862	1,099	1,129	968	769
West of Junction with John Day Highway at Arlington	970	1,178	1,233	1,412	984	1,067	1,484	1,438	1,046	1,042
East of Junction with John Day Highway at Arlington	765	820	908	1,144	707	764	928	1,037	736	749
West of Junction with Oregon-Washington Highway at Willow Creek	684	759	811	1,088	577	644	903	887	626	599
East of Junction with Oregon-Washington Highway at Willow Creek	640	723	765	1,046	478	591	772	832	573	470
Fifteen miles west of Pendleton	620	770	817	1,776	651	638	869	1,136	754	722
WEST SIDE PACIFIC HIGHWAY										
East of Junction with Tualatin Highway near St. Joseph	1,099	1,417	1,510	1,820	2,342	1,407	1,594	1,792	1,790	2,176
South of Junction with Tualatin Highway near St. Joseph	1,572	1,876	2,073	2,527	3,046	1,992	2,147	2,393	2,501	2,954
North of Junction with Tillamook Highway west of McMinnville	1,818	2,112	2,460	2,617	3,095	1,854	2,326	2,332	2,345	2,749
South of Junction with Tillamook Highway west of McMinnville	1,054	1,169	1,320	1,457	1,791	1,103	1,360	1,294	1,223	1,548
North of Junction with Salem-Dallas Highway at Rickreall	1,063	1,012	1,088	1,307	1,643	1,246	1,297	1,160	791	1,283
South of Junction with Salem-Dallas Highway at Rickreall	1,171	948	1,072	1,247	1,676	1,170	1,173	1,143	706	1,238
North of Junction with Dallas Road at Orr's Corners	.....	.....	.....	.....	.....	.....	1,144	1,297	.....	.....
On Dallas Road at Orr's Corners	.....	.....	.....	.....	.....	.....	146	183	.....	.....
South of Junction with Dallas Road at Orr's Corners	.....	.....	.....	.....	.....	.....	1,240	1,424	.....	.....
Luckiamute River at Helmick	920	930	1,038	1,230	1,671	909	1,057	1,130	.....	1,543
One-half mile south of Mary's River Bridge at Corvallis	1,470	1,448	1,724	1,825	2,126	1,606	2,087	2,234	1,803	2,087
Intersection with Pacific Highway at Junction City	1,465	1,268	1,179	1,292	1,144	1,127	1,821	1,191	2,042	1,900
THE DALLES-CALIFORNIA HIGHWAY										
Junction with Columbia River Highway near Seufert	476	610	677	621	614	543	680	782	756	709
Tygh Valley	250	301	300	235	326	248	330	321	291	324
North of Junction with Sherman Highway	.....	.....	.....	.....	.....	142	184	192	136	150
South of Junction with Sherman Highway	.....	.....	.....	.....	.....	218	258	289	223	221
South of Maupin	167	168	261	161	128	.....	.....	.....	.....	.....
One mile north of Madras	226	246	272	254	234	340	344	379	477	315
One mile north of Redmond	.....	.....	.....	.....	.....	524	652	748	772	805
One mile south of Redmond	516	560	615	642	795	.....	.....	.....	.....	.....
North of Junction with McKenzie-Bend Highway near Bend	511	513	549	552	820	571	585	631	638	829
South of Junction with McKenzie-Bend Highway near Bend	809	1,036	973	1,001	1,343	802	1,068	1,045	1,008	1,299
South limits of Bend	464	603	544	649	845	923	1,086	1,114	1,228	1,539
North of Junction with Fort Rock Road at Lapine	181	253	325	279	317	.....	.....	.....	.....	.....
On Fort Rock Road at Junction	37	49	76	107	144	.....	.....	.....	.....	.....
South of Junction with Fort Rock Road at Lapine	127	192	258	199	207	.....	.....	.....	.....	.....

TABLE No. 46—Continued

Highway and Observation Point	June 15, 1927. Wednesday	July 14, 1927. Thursday	Aug. 12, 1927. Friday	Sept. 17, 1927. Saturday	Oct. 16, 1927. Sunday	June 13, 1928. Wednesday	July 12, 1928. Thursday	Aug. 17, 1928. Friday	Sept. 15, 1928. Saturday	Oct. 14, 1928. Sunday
THE DALLES-CALIFORNIA HIGHWAY—Continued										
North of Junction with Fremont Highway south of Lapine	.....	.....	.....	.....	.....	265	385	370	322	327
South of Junction with Fremont Highway south of Lapine	.....	.....	.....	.....	.....	236	336	337	255	245
North of Junction with Crater Lake Highway near Fort Klamath	7	240	182	171	202	223	300	339	304	323
South of Junction with Crater Lake Highway near Fort Klamath	266	.....	461	375	441	361	537	612	574	491
North of Junction with Chiloquin Road	311	883	680	318	309	.....	.....	.....	.....	.....
On Chiloquin Road at Junction	406	505	395	355	406	.....	.....	.....	.....	.....
South of Junction with Chiloquin Road	709	1,046	856	643	659	.....	.....	.....	.....	.....
One mile north of city limits of Klamath Falls	1,622	1,684	1,726	1,873	1,675	1,828	1,949	2,057	2,385	2,144
North of Junction with Lakeview Highway 5 miles south of Klamath Falls	1,184	809	1,017	1,443	2,087	892	1,111	1,282	1,744	1,859
South of Junction with Lakeview Highway 5 miles south of Klamath Falls	685	473	627	936	1,102	354	575	731	958	1,004
JOHN DAY HIGHWAY										
Junction with Columbia River Highway at Arlington	298	386	415	327	333	339	599	548	349	352
North limits of Condon	291	254	300	274	325	323	352	339	361	355
North limits of Fossil	190	171	177	223	221	304	267	350	292	221
Service Creek postoffice	142	82	92	127	123	.....	.....	.....	.....	.....
One mile west of Spray	132	79	137	146	162	221	229	215	272	210
One mile east of Spray	136	70	134	131	168	212	227	227	278	185
North of Junction with Ochoco Highway near Dayville	102	58	75	79	125	200	156	203	145	119
South of Junction with Ochoco Highway near Dayville	129	94	123	102	146	217	168	230	180	152
Two miles west of John Day	347	234	225	274	282	.....	.....	.....	.....	.....
Two miles east of John Day	265	177	219	200	228	.....	.....	.....	.....	.....
West of Junction with Canyon City Road at John Day	.....	.....	.....	.....	.....	373	335	553	397	439
On road to Canyon City at Junction	.....	.....	.....	.....	.....	289	252	295	367	235
East of Junction with Canyon City Road at John Day	.....	.....	.....	.....	.....	258	247	363	510	301
West of Junction with Austin Road	144	226	191	126	165	235	257	274	157	156
Austin Road at Junction	.....	.....	157	92	140	108	107	143	109	118
East of Junction with Austin Road	.....	.....	197	141	143	257	265	260	142	152
Jamieson	84	104	113	122	151	145	139	136	173	151
West of Cairo	265	277	344	383	489	379	395	423	451	575
OLD OREGON TRAIL										
Meacham	516	577	650	1,078	575	510	635	784	613	520
One mile east of La Grande	990	1,146	1,064	1,240	1,424	1,016	1,233	1,322	1,184	1,514
One mile south of Union	629	676	686	740	782	545	647	803	664	724

Five miles south of Haines (Wingville)	808	975	978	933	1,272	731	922	1,081	992	1,052
Weatherby	332	381	414	334	360	334	400	534	354	428
West of Junction with road to Weiser north of Ontario	394	482	437	437	470	399	487	618	441	539
Weiser Road at Junction north of Ontario	610	734	645	611	734	477	608	618	544	688
East of Junction with road to Weiser north of Ontario	478	830	834	696	783	558	635	673	541	735
Between Ontario and the Idaho Line	1,211	866	1,023	1,395	1,676	1,073	1,175	1,541	1,825	1,783
North of Cairo	491	610	678	801	994	668	678	712	832	1,054
South of Cairo	337	476	466	571	764	511	477	457	600	817
CENTRAL OREGON HIGHWAY										
One mile east of Bend	295	310	337	560	702	389	346	379	462	567
OREGON-WASHINGTON HIGHWAY										
Junction with Columbia River Highway at Willow Creek	78	54	63	77	127	85	154	67	115	165
West limits of Lexington	153	115	149	166	230	166	151	166	212	248
West of Junction with Pendleton-John Day Highway near Pilot Rock	96	100	97	178	98	96	61	134	102	91
East of Junction with Pendleton-John Day Highway near Pilot Rock	120	153	172	234	147	141	110	188	176	169
Seven miles north of Pendleton	830	901	968	3,239	1,126	987	1,009	1,056	1,170	1,170
0.5 miles north of Freewater	1,614	1,791	1,973	3,404	2,404	2,660	2,091	3,244	2,740	2,654
ROOSEVELT COAST HIGHWAY										
East of Junction with Warrenton Road near Skipanon	1,718	1,288	1,509	1,003	1,033	1,366	1,363	1,625	1,039	821
On Warrenton Road north of Junction	627	461	473	383	291	573	488	546	450	316
South of Junction with Warrenton Road near Skipanon	2,015	1,480	1,790	1,135	1,154	1,761	1,645	1,998	1,311	965
North of Junction with Cannon Beach Road	441	635	893	289	424	357	769	987	404	334
On Cannon Beach Road at Junction	285	455	681	463	167	191	512	624	198	139
South of Junction with Cannon Beach Road	196	249	296	233	261	208	354	548	241	230
North of Junction with Miami Road	536	534	801	708	464	573	743	987	780	687
On road to Miami	356	337	371	482	375	244	238	160	106	142
South of Junction with Miami Road	544	542	724	597	547	618	765	931	743	637
North of Junction with McMinnville Highway at Hebo	478	582	932	681	539	472	688	792	741	847
South of Junction with McMinnville Highway at Hebo	490	563	820	754	535	557	683	709	792	967
North of Salmon River Road at Otis	.....	.....	.....	.....	.....	95	164	235	137	251
On Salmon River Road at Otis	.....	.....	.....	.....	.....	31	40	72	42	53
South of Salmon River Road at Otis	.....	.....	.....	.....	.....	105	158	290	222	169
Siletz River Bridge south of Taft	60	139	320	289	235	139	301	373	218	297
North of Agate Beach, 2.5 miles north of Newport	.....	328	387	310	264	143	318	426	185	220
South of Agate Beach, 2.5 miles north of Newport	307	322	378	305	254	151	320	404	172	240
Yaquina Bay Ferry south of Newport	18	24	33	13	closed	11	22	28	36	35
Ferry across Alsea Bay	7	10	15	9	5	3	12	14	3	11
Ferry between Florence and Glenada	.....	17	24	12	9	11	17	21	18	.....
Ferry between North Bend and Glasgow	207	248	209	270	363	311	391	400	442	607
Between Marshfield and Coquille at Coaledo	834	918	914	1,038	1,308	827	828	1,010	1,208	1,446
Between Marshfield and Coquille at Millington	1,421	1,451	1,512	1,624	1,596	.....	.....	.....	.....	.....
North of Junction with Fish Trap Road south of Coquille Bridge	715	807	850	981	978	.....	.....	.....	.....	.....
On Fish Trap Road at Junction	267	229	221	373	245	.....	.....	.....	.....	.....
South of Junction with Fish Trap Road south of Coquille Bridge	498	599	649	844	774	.....	.....	.....	.....	.....

TABLE No. 46—Continued

Highway and Observation Point	June 15, 1927. Wednesday	July 14, 1927. Thursday	Aug. 12, 1927. Friday	Sept. 17, 1927. Saturday	Oct. 16, 1927. Sunday	June 13, 1928. Wednesday	July 12, 1928. Thursday	Aug. 17, 1928. Friday	Sept. 15, 1928. Saturday	Oct. 14, 1928. Sunday
ROOSEVELT COAST HIGHWAY—Continued										
0.5 miles west of Riverton, Coquille-Bandon Section	365	452	508	571	673	567	519	638	684	797
Four miles south of Bandon	404	412	448	504	454	443	409	602	690	571
One mile north of Port Orford	223	219	271	272	258	.....	.....	.....	.....	.....
Hubbard Creek Bridge south of Port Orford	107	135	159	152	126	140	214	299	244	184
Ferry north of Gold Beach	86	118	210	197	82	154	208	230	180	163
Chetco River Bridge	.....	472	373	307	248	213	317	289	316	304
LA GRANDE-WALLOWA LAKE HIGHWAY										
Alicel	438	490	409	578	761	452	393	492	579	799
Minam Hill, 10 miles east of Elgin	209	213	219	223	358	216	199	182	232	294
3.5 miles east of Enterprise	486	525	649	616	587	437	526	673	722	514
McKENZIE HIGHWAY										
Thurston	242	532	571	657	874	579	716	748	820	809
Sparks Ranch, 1 mile west of Blue River	131	325	345	283	337	292	346	329	331	306
Lane-Deschutes County Line	.....	.....	.....	202	211	147	243	215	156	176
West of Junction with Bend Highway near Sisters	198	366	359	368	360	227	383	377	321	349
East of Junction with Bend Highway near Sisters	124	113	126	125	123	214	139	120	130	127
McKENZIE-BEND HIGHWAY										
Junction with McKenzie Highway near Sisters	101	256	214	242	237	16	247	259	191	222
Junction with The Dalles-California Highway near Bend	276	496	416	420	545	234	471	421	363	435
WILLAMETTE HIGHWAY										
Junction with Pacific Highway at Goshen	420	428	421	479	615	414	445	579	650	528
BAKER-CORNUCOPIA HIGHWAY										
Two miles east of Baker	.....	.....	.....	.....	.....	195	188	266	309	354
Foot of Flagstaff Hill, 7 miles east of Baker	272	239	201	262	324	.....	.....	.....	.....	.....
PRINEVILLE SOUTH HIGHWAY										
One-half mile south of Prineville	35	60	73	133	98	62	59	108	112	98
FREMONT HIGHWAY										
Junction with The Dalles-California Highway south of Lapine	.....	.....	.....	.....	.....	54	53	56	90	127
North of Junction with Adel Market Road, 5 miles north of Lakeview	214	184	186	181	171	258	202	194	239	147
On Adel Market Road at Junction	132	55	66	81	134	106	69	107	109	149
South of Junction with Adel Market Road, 5 miles north of Lakeview	301	239	237	256	292	156	271	300	348	296
Four miles south of Lakeview	192	184	231	262	204	255	287	280	338	271

TUALATIN VALLEY HIGHWAY										
East of Junction with Bertha-Beaverton Highway	1,875	458	349	328	405	2,560	561	581	1,163	1,621
West of Junction with Bertha-Beaverton Highway	2,932	2,865	2,387	2,696	4,518	2,771	3,158	3,348	3,766	4,584
Junction with West Side Highway near St. Joseph	710	733	777	970	1,215	799	794	878	1,065	1,188
ALBANY-CORVALLIS HIGHWAY										
Granger-Midway between Albany and Corvallis	924	1,018	1,017	1,150	1,650	927	1,029	1,083	1,440	1,358
SALEM-DALLAS HIGHWAY										
West of Junction at Rickreall	662	652	664	789	981	736	756	633	661	1,044
East of Junction at Rickreall	1,164	1,208	1,282	1,365	1,783	1,280	1,337	1,238	1,091	1,388
McMINNVILLE-TILLAMOOK HIGHWAY										
Junction with West Side Highway near McMinnville	806	1,006	1,244	1,365	1,466	807	1,064	1,130	1,174	1,367
Junction with Roosevelt Coast Highway at Hebo	494	609	864	915	592	553	728	893	890	1,121
CORVALLIS-NEWPORT HIGHWAY										
East of Junction with Alsea Highway near Philomath	958	1,001	1,116	1,350	1,365	905	1,105	1,254	1,431	1,420
West of Junction with Alsea Highway near Philomath	656	667	685	865	900	557	711	803	864	913
Eddyville	289	399	430	375	473	250	359	465	391	499
East of Siletz Road, 1.25 miles west of Toledo	394	453	515	469	582	411	468	548	448	553
On Siletz Road, 1.25 miles west of Toledo	255	251	263	339	263	428	290	274	342	347
West of Siletz Road, 1.25 miles west of Toledo	415	493	526	407	550	277	519	552	493	482
COOS BAY-ROSEBURG HIGHWAY										
Junction with Pacific Highway at Winston	306	385	401	408	369	353	370	597	502	433
East of Junction with Powers Road, 2 miles east of Myrtle Point	454	514	575	562	560	526	612	662	788	664
On Powers Road at Junction	283	314	337	389	364	271	280	294	426	332
West of Junction with Powers Road, 2 miles east of Myrtle Point	633	764	831	862	834	733	852	881	1,139	936
Halfway between Myrtle Point and Coquille	638	898	1,007	1,038	1,116	909	913	929	1,210	1,192
OREGON CAVES ROAD										
At Junction with Redwood Highway south of Kerby	152	173	183	127	105	119	255	229	161	161
OCHOCO HIGHWAY										
One mile east of Redmond	324	242	339	396	414	339	338	335	412	484
One mile west of Prineville	306	339	459	482	652	334	335	356	546	534
One mile east of Prineville	383	363	324	409	408	334	326	346	416	446
Summit in Ochoco National Forest	58	64	84	75	80	85	101	88	86	57
Junction with John Day Highway, 4 miles north of Dayville	36	49	60	35	57	62	40	66	37	38

TABLE No. 46—Continued

Highway and Observation Point	June 15, 1927. Wednesday	July 14, 1927. Thursday	Aug. 12, 1927. Friday	Sept. 17, 1927. Saturday	Oct. 16, 1927. Sunday	June 13, 1928. Wednesday	July 12, 1928. Thursday	Aug. 17, 1928. Friday	Sept. 15, 1928. Saturday	Oct. 14, 1928. Sunday
KLAMATH FALLS-LAKEVIEW HIGHWAY										
Junction with The Dalles-California Highway south of Klamath Falls	549	397	440	618	1,062	596	594	637	864	928
West of Junction with Yonna Valley Road, 2 miles east of Dairy	269	194	258	269	355	290	332	298	488	414
On Yonna Valley Road at Junction	75	63	77	103	88	58	84	69	110	63
East of Junction with Yonna Valley Road, 2 miles east of Dairy	251	149	197	195	281	236	251	237	390	349
Three miles west of Lakeview	254	229	316	363	362	255	282	315	364	391
ASHLAND-KLAMATH FALLS HIGHWAY										
Junction with Pacific Highway south of Ashland	450	463	496	497	658	422	530	557	613	661
West of Junction with Dorris Road west of Keno	405	606	648	834	864	491	642	594	789	1,017
On Dorris Road at Junction west of Keno	527	165	198	213	240	189	189	180	181	161
East of Junction with Dorris Road west of Keno	128	735	834	1,033	1,078	661	845	758	950	1,150
CRATER LAKE HIGHWAY										
South of Eagle Point, 9.0 miles north of Medford	.....	.....	.....	.....	.....	491	702	1,056	921	817
South of Junction with Derby Road at McLeod Bridge	119	547	550	321	356	202	498	489	269	248
On Derby Road at McLeod Bridge Junction	72	99	64	45	57	34	79	47	60	16
North of Junction with Derby Road at McLeod Bridge	125	550	544	321	361	186	513	472	269	247
Prospect Arch Bridge	628	.....	.....	414	392	.....	.....	.....	.....	.....
At Junction with The Dalles-California Highway near Fort Klamath	253	300	405	322	363	245	454	536	422	344
REDWOOD HIGHWAY										
Junction with Pacific Highway south of Grants Pass	1,213	997	1,024	1,052	823	1,466	1,672	1,685	1,449	1,540
West of Junction with Murphy Road	.....	1,045	.....	.....	.....	.....	.....	.....	.....	.....
North of Junction with Oregon Caves Highway south of Kerby	344	424	430	282	212	294	567	543	444	283
South of Junction with Oregon Caves Highway south of Kerby	304	332	371	218	203	238	482	462	342	226
MT. HOOD HIGHWAY										
West of forks of road at east limits of Sandy	528	926	977	1,256	2,753	801	1,148	1,181	1,293	2,218
Bull Run Road at Junction at east limits of Sandy	83	107	105	150	210	126	161	143	192	238
East of forks of road at east limits of Sandy	460	845	918	1,139	2,607	721	1,099	1,116	1,156	2,074
Horse Thief Meadows	closed	213	250	183	460	closed	235	241	114	357
Junction with Columbia River Highway near Hood River	998	943	1,015	1,329	1,596	1,060	1,191	1,100	1,996	1,922
ALSEA HIGHWAY										
Junction with Corvallis-Newport Highway near Philomath	444	482	513	557	510	358	569	559	730	561
Schoolhouse at Alsea	187	242	351	313	326	217	219	285	288	370

PENDLETON-JOHN DAY HIGHWAY										
Junction with Oregon-Washington Highway near Pilot Rock	47	61	72	59	65	57	53	66	92	90
SHERMAN HIGHWAY										
Junction with Columbia River Highway at Biggs	198	256	245	240	145	178	275	263	419	248
One mile south of Wasco	247	293	345	256	293	.....	.....	.....	.....	.....
One mile south of Moro	224	275	322	276	321	227	242	286	504	273
One mile north of Shaniko	85	83	103	115	93	.....	.....	.....	.....	.....
One mile south of Shaniko	97	87	103	77	89	.....	.....	.....	.....	.....
Junction with The Dalles-California Highway	.....	.....	.....	.....	.....	102	93	105	95	90
ENTERPRISE-FLORA HIGHWAY										
Fourteen miles north of Enterprise	83	79	94	77	107	93	58	71	76	76
SIUSLAW HIGHWAY										
Greenleaf Creek, 3 miles east of Greenleaf	113	122	109	137	210	92	105	159	210	201
1.5 miles west of Cheshire	345	327	353	435	496	382	316	352	497	467
SANTIAM HIGHWAY										
West of Junction with Crabtree Road	306	498	403	653	839	678	626	723	705	799
On Crabtree Road at Junction	207	198	204	294	407	268	266	290	306	294
East of Junction with Crabtree Road	161	370	361	457	664	487	460	505	515	661
BAKER-UNITY HIGHWAY										
Dooley Mountain	98	128	101	98	168	109	122	134	149	131
UMPQUA HIGHWAY (COUNTY)										
Ferry at Scottsburg	.....	.....	.....	.....	.....	110	111	124	119	174
BERTHA-BEAVERTON HIGHWAY										
Junction with Tualatin Valley Highway	1,494	2,672	2,151	2,327	4,213	262	2,740	2,885	2,708	3,093
Total vehicles counted	144,056	157,649	164,599	176,784	199,865	144,561	171,494	182,783	178,430	185,904

PERCENTAGE CLASSIFICATION OF VEHICLES COUNTED

	June 15, 1927. Wednesday	July 14, 1927. Thursday	Aug. 12, 1927. Friday	Sept. 17, 1927. Saturday	Oct. 16, 1927. Sunday	June 13, 1928. Wednesday	July 12, 1928. Thursday	Aug. 17, 1928. Friday	Sept. 15, 1928. Saturday	Oct. 14, 1928. Sunday
Oregon registered passenger cars	66.51	61.26	62.67	70.86	83.95	64.64	60.04	61.50	70.78	81.64
Passenger cars from other states	21.45	27.24	25.13	17.71	11.49	22.70	28.20	25.45	17.11	12.73
Stages and busses	1.34	1.24	1.27	1.12	0.92	1.40	1.31	1.29	1.27	1.12
Trucks, 1.5 tons and under	5.99	6.08	6.33	6.26	2.05	6.19	6.26	6.58	6.48	2.86
Trucks, over 1.5 tons	3.76	3.46	3.70	3.13	1.02	4.22	3.57	4.45	3.74	1.27
Motorcycles	0.49	0.38	0.45	0.44	0.43	0.48	0.37	0.34	0.36	0.29
Horse-drawn vehicles	0.46	0.34	0.45	0.48	0.14	0.37	0.25	0.39	0.26	0.09
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE No. 47

COMPARISON OF 1928 TRAFFIC COUNTS WITH COUNTS OF PREVIOUS YEARS

This table has been prepared from the results of traffic counts taken on one day of each of the three months of July, August and September of each of the years 1923 to 1928, inclusive. Each number given is the per day average of the motor vehicles counted on the three days of the respective year. Each day's count covered only the 16 hours between 6:00 a. m. and 10:00 p. m. July counts were taken on Thursdays; the August counts were taken on Fridays, and the September counts were taken on Saturdays.

Highway and Observation Point	Average for July, August and Sept., 1923	Average for July, August and Sept., 1924	Average for July, August and Sept., 1925	Average for July, August and Sept., 1926	Average for July, August and Sept., 1927	Average for July, August and Sept., 1928
PACIFIC HIGHWAY						
South of Junction with County Road south of Oswego	1,471	1,998	1,472	2,413	2,643	2,959
South of Junction with County Road north of Aurora	1,987	2,558	2,496	2,690	3,062	2,998
Santiam River Bridge at Jefferson	1,550	1,776	1,724	1,994	2,205	2,414
North of Junction with West Side Highway at Junction City	659	817	1,117	1,008	1,295	1,580
South of Junction with West Side Highway at Junction City	1,629	1,835	1,984	1,717	2,271	2,949
Yoncalla	971	1,293	1,450	1,512	1,564	1,520
One mile south of Wolf Creek	775	931	1,018	1,203	1,217	1,213
South of Junction with Redwood Highway south of Grants Pass	1,539	1,473	1,642	1,786	1,881	1,770
One mile south of Medford	3,944	4,429	4,490	3,453	3,341	3,564
South of Junction with Ashland-Klamath Falls Highway	729	961	971	1,015	1,093	1,121
COLUMBIA RIVER HIGHWAY						
Clatsop-Columbia County Line	877	879	878	1,077	1,094	1,089
Columbia-Multnomah County Line	1,907	1,456	1,485	1,633	1,770	1,890
One mile west of Cascade Locks	1,207	1,455	1,625	1,638	1,758	1,968
West of Junction with Sherman Highway at Biggs	520	727	933	1,032	1,081	1,155
East of Junction with John Day Highway at Arlington	545	573	819	863	957	900
Fifteen miles west of Pendleton	517	627	1,061	1,085	1,121	920
WEST SIDE PACIFIC HIGHWAY						
North of Junction with Tualatin Highway near St. Joseph	420	574	808	1,305	1,582	1,725
South of Junction with Tualatin Highway near St. Joseph	861	1,127	1,329	1,890	2,159	2,347
North of Junction with Tillamook Highway west of McMinnville	688	1,625	2,054	2,296	2,396	2,334
South of Junction with Tillamook Highway west of McMinnville	306	873	1,137	1,252	1,315	1,292
One-half mile south of Mary's River Bridge at Corvallis	1,086	1,296	1,897	1,540	1,666	2,041
Intersection with Pacific Highway at Junction City	1,002	1,030	1,401	901	1,246	1,685
THE DALLES-CALIFORNIA HIGHWAY						
Tygh Valley	162	194	182	251	279	314
One mile north of Madras	125	141	194	198	257	400
North of Junction with Crater Lake Highway near Fort Klamath	52	74	119	180	198	314
South of Junction with Crater Lake Highway near Fort Klamath	186	301	312	381	418	574
North of Junction with Lakeview Highway five miles south of Klamath Falls	613	570	756	1,008	1,090	1,379
South of Junction with Lakeview Highway five miles south of Klamath Falls	352	341	545	589	679	755
JOHN DAY HIGHWAY						
North of limits of Condon	154	90	159	252	276	351
One mile west of Spray	72	65	88	110	121	239
South of Junction with Ochoco Highway near Dayville	51	59	60	110	106	193
Jamieson	118	125	69	109	113	149

TABLE No. 47—Continued

Highway and Observation Point	Average for July, August and Sept., 1923	Average for July, August and Sept., 1924	Average for July, August and Sept., 1925	Average for July, August and Sept., 1926	Average for July, August and Sept., 1927	Average for July, August and Sept., 1928
OLD OREGON TRAIL						
Meacham	280	549	658	825	768	677
One mile south of Union	373	509	516	616	701	705
Weatherby	245	324	311	382	376	429
West of Junction with road to Weiser north of Ontario	249	348	401	424	452	515
East of Junction with road to Weiser north of Ontario	259	320	432	590	787	616
Between Ontario and the Idaho Line	697	746	914	1,138	1,095	1,514
South of Cairo	377	250	324	382	504	511
ROOSEVELT COAST HIGHWAY						
South of Junction with Warrenton Road near Skipanon	1,220	1,228	1,233	1,454	1,468	1,651
North of Junction with McMinnville Highway at Hebo	475	802	540	632	732	740
South of Junction with McMinnville Highway at Hebo	405	604	506	621	712	728
Between Marshfield and Coquille at Coaledo	546	805	754	868	957	1,015
North of Gold Beach	67	142	104	130	175	206
McKENZIE HIGHWAY						
Thurston	275	361	443	524	587	761
West of Junction with Bend Highway near Sisters	83	126	205	323	364	360
TUALATIN VALLEY HIGHWAY						
West of Junction with Bertha-Beaverton Highway	2,224	2,604	2,898	2,574	2,649	3,424
Junction with West Side Highway near St. Joseph	531	648	662	805	827	912
McMINNVILLE-TILLAMOOK HIGHWAY						
Junction with West Side Highway near McMinnville	486	1,025	1,030	1,228	1,205	1,123
Junction with Roosevelt Coast Highway at Hebo	539	865	563	695	796	837
CORVALLIS-NEWPORT HIGHWAY						
Eddyville	198	274	273	317	401	405
COOS BAY-ROSEBURG HIGHWAY						
Junction with Pacific Highway at Winston	317	356	342	457	398	490
Halfway between Myrtle Point and Coquille	485	724	743	959	981	1,017
OCHOCO HIGHWAY						
One mile east of Prineville	222	231	255	282	365	363
Junction with John Day Highway four miles north of Dayville	16	16	12	39	48	48
KLAMATH FALLS-LAKEVIEW HIGHWAY						
Junction with The Dalles-California Highway south of Klamath Falls	251	248	372	425	485	698
Three miles west of Lakeview	145	161	179	250	303	320
ASHLAND-KLAMATH FALLS HIGHWAY						
Junction with Pacific Highway south of Ashland	163	347	393	501	485	567
CRATER LAKE HIGHWAY						
North of Junction with Derby Road at McLeod Bridge	222	284	287	291	472	418
At Junction with The Dalles-California Highway near Fort Klamath	139	243	291	291	342	471
REDWOOD HIGHWAY						
Junction with Pacific Highway south of Grants Pass	719	834	968	906	1,024	1,602
North of Junction with Oregon Caves Highway south of Kerby	178	222	295	365	379	518
MT. HOOD HIGHWAY						
East of forks of road at east limits of Sandy	317	556	702	751	967	1,124
SHERMAN HIGHWAY						
Junction with Columbia River Highway at Biggs	142	177	177	210	247	319
One mile south of Moro	262	272	218	216	291	344
Total vehicles counted	40,829	50,185	54,993	60,613	66,490	72,819



TOP—OILED SURFACING ON COLUMBIA RIVER HIGHWAY EAST OF ARLINGTON; CENTER—McKENZIE HIGHWAY WEST OF SISTERS; BOTTOM—THE DALLES-CALIFORNIA HIGHWAY SOUTH OF LAPINE

PART FIVE

Description of Work

of the

State Highway Department

in the

Counties of the State

1927-1928

BAKER COUNTY

Baker County is the middle county of the three large counties on the eastern boundary of the state and is largely of a mountainous nature. There are, however, several valleys formed by the streams flowing from the Blue Mountains on the west and the Wallowa Mountains on the north.

In the early years of the nineteenth century the trappers, traders and explorers developed a route from the Snake River at the southeast corner of the county to a point on the north boundary near what is now the northwest corner. This route became the one by which the emigrant trains traveled to the Oregon country, and became known as the Old Oregon Trail. A modern highway now closely follows the old emigrant route. The surveys and construction on this highway through Baker County were completed during previous years. Another highway of importance which traverses a portion of this county across the southwest corner is the John Day Highway; the grading on this highway being completed during the previous biennium and the surfacing being completed during the present biennium.

The highway known as the Baker-Unity Highway forms a connecting link between the Old Oregon Trail at Baker and the John Day Highway near Unity, crossing a spur of the Blue Mountains between the Powder River and Burnt River valleys.

The Baker-Cornucopia Highway extends easterly from Baker to the Lower Powder River Valley, Eagle Valley and Pine Valley. The three valleys support a considerable farming community and this highway is important in that it furnishes an outlet for this portion of Baker County.

The construction work on the State Highway System in this county during 1927 and 1928 consisted of 10.52 miles of grading and 14.5 miles of surfacing on the Baker-Unity Highway; and 3.5 miles of grading and 5.5 miles of surfacing on the Baker-Cornucopia Highway. There are 211.53

miles of state highways in Baker County, including the mileage in towns, divided as follows: 71.95 miles on the Old Oregon Trail, graded, macadamized and surface treated with oil; 23.10 miles on the John Day Highway graded and macadamized; 44.78 miles on the Baker-Unity Highway, all of which has been graded and 23.9 miles macadamized; and 71.70 miles on the Baker-Cornucopia Highway of which 64.7 miles have been graded and 34.08 miles macadamized.

The incompleted portion of the state highways in Baker County consists of approximately 5.0 miles on the Baker-Cornucopia Highway.

All state highway work in Baker County covered by this report, including surveys, construction and maintenance, was under the supervision of H. G. Smith, Division Engineer.

Dry Gulch Surfacing

On the Baker-Cornucopia Highway, from a point approximately seven miles west of Richland to a point approximately 1.5 miles west of Richland; 5.5 miles of gravel surfacing.

Contract No. 920, awarded September 28, 1926, to Carl T. Habekost, of Gearhart, Oregon. Work commenced October 20, 1926; completed March 23, 1927. Final cost, $15,120.77. Resident Engineer, W. C. Williams.

When the grading on this section was completed, it was found necessary to surface the roadbed as winter weather condition caused the grade to become soft and difficult to travel upon.

Further details will be found on page 194 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,216.80
Contract items as follows:		
Base course surfacing, 3,351.0 cu. yds. at $1.74	$ 5,830.74	
Top course surfacing, 3,859.5 cu. yds. at $1.74	6,715.53	
Maintenance materials, 1,101.8 cu. yds. at $1.10	1,211.98	
Hauling maintenance materials, 728.6 yd. mi. at 20c	145.72	
Total amount paid to contractor		13,903.97
Grand total cost of project		$ 15,120.77

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 85.35	$	$ 85.35
Expended 1927-28 biennium	11,702.09	3,333.33	15,035.42
Total of expenditures	$11,787.44	$ 3,333.33	$ 15,120.77

Unity-Hereford Surfacing

On the Baker-Unity Highway, from Sta. 84, which is about 2.0 miles northeast of Unity, to Sta. 834 which is approximately 3.7 miles east of Hereford; 14.5 miles of crushed rock surfacing, 16 feet wide and 8 inches to 14 inches in depth.

Contract No. 1,006, awarded October 25, 1927, to Joslin & McAllister, of Spokane, Washington. Work commenced June 1, 1928; completed October 11, 1928. Estimated cost, $77,000, to be paid $41,000 from state funds and $36,000 from county funds. Resident Engineer, W. C. Williams.

[BAKER]

The grading on this section was completed in June, 1927. The winter of 1926-1927 indicated that an earth roadbed would not carry the traffic and that surfacing was necessary. The surfacing of this section gives traffic an all-year roadway via the Baker-Unity Highway from points in the John Day valley to Baker. A change was made in the location of the quarry near Unity after the contract was let, the material in the quarry originally designated having proved to be unsound. Another quarry with suitable material was found on the same hillside but at a much higher elevation. The change in quarry caused extra expense as a longer hauling road was necessary.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,954.61
Labor and materials furnished by the state:		
Lease of filler pit and stock pile site		30.00
Signs for traffic cntrol		9.16
Prospecting for surfacing materials		15.25
Sprinkling surfacing materials		2,337.70
Credit for surfacing materials used on other projects		Cr. 2,445.00
Contract items as follows:		
Sub-base course surfacing, 1,475.0 cu. yds. at $1.78	$ 2,625.50	
Base course surfacing, 17,660.0 cu. yds. at $1.78	31,434.80	
Top course surfacing, 13,128.0 cu. yds. at $1.78	23,367.84	
Maintenance materials, 2,884.8 cu. yds. at $1.35	3,894.48	
Additional maintenance materials, 1,500.0 cu. yds. at $1.00	1,500.00	
Truck haul, 5,250.0 yd. mi. at 18c	945.00	
Earth filler, 4,896.0 cu. yds. at 20c	979.20	
Filler haul, 8,002.0 yd. mi. at 20c	1,600.40	
Stripping filler pits, 40.2 cu. yds. at 25c	10.05	
Force account items:		
Construction of non-segregating bunker	270.55	
Drilling and shooting quarry at Sta. 246	657.60	
Construction of extra hauling road from quarry to highway	258.01	
Extra hauling made necessary by abandonment of quarry Sta. 246	1,649.25	
Shooting filler pit where unable to plow	23.36	
Total amount earned by contractor	$69,216.04	
Less final estimate in process of payment	17,717.79	
Total amount paid to contractor		51,498.25
Grand total expended on project, 1927-28		$ 54,399.97

PARTICIPATION IN COST

	State	*County*	*Total*
Expended to date	$22,216.69	$32,183.28	$ 54,399.97
Estimated cost to complete	18,783.31	3,816.72	22,600.03
Total estimated costs	$41,000.00	$36,000.00	$ 77,000.00

Unity-Hereford Grading

On the Baker-Unity Highway, from Hereford, on Burnt River, approximately 33.5 miles southwest of Baker, to Unity on the John Day Highway; 10.52 miles of grading.

Contract No. 900, awarded July 29, 1926, to Henry C. Boyer, of Ontario, Oregon. Work commenced September 20, 1926; completed June 15, 1927. Final cost, $73,606.32. Resident Engineer, W. C. Williams.

With the completion of this section, the grading of the Baker-Unity Highway was finished, giving a graded or macadamized highway from Unity on the John Day Highway to Baker on the Old Oregon Trail.

Further details will be found on page 200 of the 1925-26 report.

[BAKER]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5,147.67
Prospecting for surfacing materials		16.65
Contract items as follows:		
Clearing and grubbing, all	$ 525.00	
Common excavation, 43,947.1 cu. yds. at 23c	10,107.83	
Intermediate excavation, 38,378.6 cu. yds. at 48c	18,421.73	
Solid rock excavation, 19,987.2 cu. yds. at 80c	15,989.76	
Overhaul, 53,787.0 yd. sta. at 5c	2,689.35	
18-inch concrete culvert pipe, 1,440.0 lin. ft. at $2.50	3,600.00	
24-inch concrete culvert pipe, 555.0 lin. ft. at $3.60	1,998.00	
36-inch concrete culvert pipe, 396.0 lin. ft. at $6.50	2,574.00	
18-inch concrete siphon pipe, 276.0 lin. ft. at $2.60	717.60	
24-inch concrete siphon pipe, 93.0 lin. ft. at $3.65	339.45	
36-inch concrete siphon pipe, 44.0 lin. ft. at $6.65	292.60	
Class "A" concrete, 44.43 cu. yds. at $25.00	1,110.75	
Class "B" concrete, 85.08 cu. yds. at $23.00	1,956.84	
Dry rubble, 291.21 cu. yds. at $4.00	1,164.84	
Riprap, 112.5 cu. yds. at $3.00	337.50	
Lumber and timber, 83.275 M-FBM at $62.50	5,204.69	
Earth cushion, 1,933.0 cu. yds. at 25c	483.25	
Earth cushion payhaul, 3,239.5 yd. mi. at 20c	647.90	
Dry rubble payhaul, 794.08 yd. mi. at 30c	238.22	
Force account items:		
Redistributing culvert pipe due to change in plans	42.69	
Total amount paid to contractor		68,442.00
Grand total cost of project		$ 73,606.32

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 3,443.98	$ 2,025.40	$ 5,469.38
Expended 1927-28 biennium	35,704.56	32,432.38	68,136.94
Total of expenditures	$39,148.54	$34.457.78	$ 73,606.32

Snake River Bridge at Ballards Landing

On County Highway, between Homestead, Oregon, and Council, Idaho; one 320-foot and one 120-foot steel span with five 19-foot timber spans.

Contract No. 876, awarded April 29, 1926, to Portland Bridge Company, of Portland, Oregon. Work commenced May 10, 1926; completed April 2, 1927. Final cost, $68,278.18. Resident Engineer, C. A. Jordan.

This structure was contracted for a lump sum of $65,000. Due to unforeseen foundation conditions it was necessary to change the design of piers No. 2 and No. 3, and of the timber bent on the east approach. This change in design made the structure cost the contractor $3,278.55 more than the original design. The above amount was allowed to the contractor as a special adjustment over and above the $65,000 shown in the contract.

The main span of this structure, 320 feet long, is the longest single truss span built in the state during this biennium. The bridge replaces the Ballard's ferry, and provides a much needed connection between the mines on the Idaho side of the Snake River, and the railroad on the Oregon side at Homestead.

The final cooperative costs now consist of $13,811.27 from state funds, $26,260.84 from state of Idaho funds, $14,706.07 from Idaho Copper Company funds and $13,500.00 from Baker County funds.

Further details will be found on page 205 of the 1925-26 report.

[BAKER]

Timber Canyon Grading

On Baker-Cornucopia Highway, from a point on Powder River east of Richland to the top of the grade at the west end of the Sag section; 3.55 miles of graded roadbed.

Contract No. 919, awarded September 28, 1926, to H. E. Cornell, of Boise, Idaho. Work commenced October 20, 1926; completed July 8, 1927. Final cost, $87,980.58. Resident Engineer, W. C. Williams.

The 3.55 miles of graded roadbed on this section completed the grading of the Baker-Cornucopia Highway to state standards from Baker on the Old Oregon Trail to Halfway in Pine Valley, and eliminated a very steep, narrow grade on the old county road.

Further details will be found on page 196 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5,808.07
Contract items as follows:		
Clearing and grubbing, all	$ 100.00	
Intermediate excavation, 13,990.5 cu. yds. at 45c	6,295.73	
Solid rock excavation, 75,927.9 cu. yds. at 78c	59,223.76	
Overhaul, 20,931.0 yd. st. at 5c	1,046.55	
18-inch concrete pipe, 828.0 lin. ft. at $2.20	1,821.60	
24-inch concrete pipe, 141.0 lin. ft. at $3.00	423.00	
36-inch concrete pipe, 220.0 lin. ft. at $6.00	1,320.00	
Dry rubble, 43.46 cu. yds. at $4.00	173.84	
Class "A" concrete, 90.43 cu. yds. at $30.00	2,712.90	
Metal reinforcement, 10,053.0 lbs. at 10c	1,005.30	
Earth cushion, 6,166.0 cu. yds. at 75c	4,624.50	
Cushion payhaul, 16,845.25 yd. mi. at 20c	3,369.05	
Force account items:		
Constructing blind stone drains under box culverts at Sta. 112 and 115	56.28	
Total amount paid to contractor		82,172.51
Grand total cost of project		$ 87,980.58

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 528.45	$	$ 528.45
Expended 1927-28 biennium	5,279.62	82,172.51	87,452.13
Total of expenditures	$ 5,808.07	$82,172.51	$ 87,980.58

Maintenance

At the close of the 1927-1928 biennium there are 197.19 miles of state highways under maintenance in Baker County, of which 67.61 miles are oil-surface-treated macadam, 70.75 miles untreated macadam, and 58.83 miles of graded roadbed.

The state highways are divided into units known as patrol or maintenance sections with a patrolman in charge of each section who employs extra men from time to time in order that the highways may be maintained properly.

Maintenance work on the Old Oregon Trail from North Powder to Haines is in charge of N. D. Johnson with headquarters at Union. On the Old Oregon Trail from Haines to Baker and from Baker to Pleasant Valley, and on the Baker-Unity Highway from Baker to Salisbury, Roland

[BAKER]

Hopper is the patrolman in charge with headquarters at Baker. During the summer of 1927 Mr. Hopper was assigned as an extra gang foreman. Mr. Harve Morin was in charge of this patrol until Mr. Hopper's return in the fall. During the spring, summer and fall of 1928, Mr. Hopper was again assigned as an extra gang foreman and the patrol was placed in charge of D. F. Dimmick and Irwin Wulf successively. The patrol section on the Old Oregon Trail from Pleasant Valley to Huntington is in charge of Thos. Roach with headquarters at Durkee. The section from Huntington to the Malheur County line is in charge of H. A. Haines, with headquarters at the Snake River patrol house. On the Baker-Unity Highway from Salisbury to Unity, the patrol was in charge of Lester McCann and Walter N. Greene successively, headquarters at Hereford. On the John Day Highway from the Grant County line to Unity the patrol is in charge of Chas. Powell, with headquarters near Austin. The section from Unity to the Malheur County line is in charge of Frank Lund with headquarters at Ironside in Malheur County. On the Baker-Cornucopia Highway from Baker to Black Bridge the section was in charge of R. L. Nelson, deceased, Bird Caviness, and S. Marker successively, with headquarters at Keating. The section from Black Bridge to Halfway is in charge of A. B. Carder with headquarters at Richland.

Certain classes of maintenance and special work, such as oiling, reoiling, guard fence, replacing culverts, etc., are performed with extra gangs in charge of foremen. Extra gang foremen were Roland Hopper, Harrison Davis, I. I. Basey and F. B. Hurt.

General supervision of maintenance work in Baker County during the past biennium was directed by J. N. Bishop, Resident Maintenance Engineer, with headquarters at Baker. Mr. H. G. Smith, Division Engineer at La Grande, is in general charge of all maintenance in the division. Mr. R. H. Baldock is State Maintenance Engineer in charge of all maintenance in the state, with headquarters at Salem.

Baker-Ontario Maintenance Materials

On the Old Oregon Trail Highway, from the south city limits of Baker, at Mile Post 340, to the north city limits of Ontario at Mile Post 421; 81 miles on which stock-piled materials were used.

Contract No. 880, awarded May 25, 1926, to H. J. Hildeburn, of Portland, Oregon. Work commenced July 5, 1926; completed April 2, 1927. Final cost, $35,006.15. Resident Engineer, J. N. Bishop.

The maintenance materials manufactured under this contract were used in maintenance and oiling operations.

Further details will be found on page 209 of the 1925-26 report.

[BAKER]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,174.09
Lease of gravel pits		597.00
Credit for gravel sold to Idaho Highway Department	Cr.	40.50
Contract items as follows:		
Grade "A" maintenance materials, 6,085.4 cu. yds. at $1.75	$10,649.45	
Grade "B" maintenance materials, 15,339.9 cu. yds. at $1.25	19,174.88	
Maintenance material haul, 6,558.7 yd. mi. at 25c	1,639.68	
Haul from Payette pit, 4,690.9 yd. mi. at 25c	1,172.73	
Stockpiled sand, 712.6 cu. yds. at 30c	273.78	
Hauling sand, 1,825.2 yd. mi. at 20c	365.04	
Total amount paid to contractor		33,275.56
Grand total cost of project, all state funds		$ 35,006.15

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$16,949.41
Expended 1927-28 biennium	18,056.74
Total of expenditures	$35,006.15

Right-of-Way at Unity Junction

At the Junction of the John Day Highway and the Baker-Unity Highway near Unity.

When the Baker-Unity Highway was completed, a junction was formed with the John Day Highway near Unity and a wye connection was made. In order to prevent the erection of sign boards or other obstructions the Highway Commission authorized that the land be purchased.

Expenditures for the biennium have amounted to $615.69 from state funds.

Additional Right-of-Way between Haines and Baker

On the Old Oregon Trail Highway, between Haines and Baker.

The right-of-way originally secured during construction proved to be inadequate for proper grade widening, ditches, and other highway development. Negotiations have been started on several tracts, several tracts have been acquired and fences moved back to the new right-of-way line. The negotiations for this right-of-way have been handled by Judge Wm. Duby, former State Highway Commissioner; E. G. Bickmore, of the Highway office at La Grande, and by Mr. H. G. Smith, Division Engineer of La Grande.

Expenditures for the biennium have amounted to $615.69 from state funds.

Halfway-Carson Survey

This survey was made at the request of the Baker County Court. The survey extended from the town of Halfway in Pine Valley to a point near Carson in Pine Valley. This crosses the most settled portion of Pine Valley.

Middle Bridge-Richland Revision Survey

For details of this survey see page 143 of the 1919-1920 report, page 173 of the 1923-1924 report, and page 209 of the 1925-1926 report.

BENTON COUNTY

During the past biennium the entire State Highway System within the limits of Benton County has been completed to the state standard grade and macadam surfacing, which work has been responsible for the expenditure of a quite large amount of state and county funds.

As continuing projects carried over from the 1925-1926 biennium, the Alsea Highway from its junction with the Corvallis-Newport Highway at Philomath to the Lincoln County Line has been graded and surfaced, and the Corvallis-Newport Highway from the city limits of Corvallis to the Lincoln County Line has likewise been completed as to grading and surfacing.

State work in Benton County, exclusive of major bridge construction, has been carried on under the direction of J. S. Sawyer, Division Engineer, Salem, Oregon.

Pacific and Albany-Corvallis Highways Paving Gaps

On the Pacific and Albany-Corvallis Highways, 0.56 miles of concrete pavement.

Contract No. 959, awarded March 29, 1927, to W. W. Head Construction Company, of Eugene, Oregon. Work commenced April 9, 1927; completed July 20, 1927. Final cost, $31,548.81. Resident Engineer, A. A. Amort, Corvallis, Oregon.

This project consisted of the paving of a number of short gaps in the Pacific and Albany-Corvallis Highways aggregating 0.56 mile in total length, which gaps had been omitted from the original paving program for various reasons, such as settlement of high fills not yet ready to pave, and the approaches to bridges at that time unconstructed. These several short gaps are segregated as follows:

On the Albany-Corvallis Highway: The gap at the east end of the Albany bridge, 110 feet long; the gap at the west end of the Albany bridge, 1,409 feet long; the gap at Palmer Fill, 178 feet long; the gap at Bower's Slough Bridge, 88 feet long, and the gap at Medley Fill, 215 feet long. On the Pacific Highway: The gap at the north end of the Harrisburg Bridge, 934 feet long.

The specifications for this project provided for taking care of and passing traffic uninterruptedly over the work, which necessitated that the gaps be paved one-half at a time, carrying traffic over the project on the old macadam on a one-way detour controlled by flagmen. This operation worked out very satisfactorily.

A feature of particular interest in connection with this project was that the specification provided for a richer mix of concrete than is ordinarily specified in our standard concrete pavement. This concrete was to be mixed with a less amount of water for a longer time, which gave concrete having a compressive strength of 3,000 pounds or more per square inch, and could be opened to traffic from within 6 to 10 days. Curing of the pavement on these gaps was done by the ordinary sprinkling method.

After the first half slab had been laid with quick-setting specifications, cured and open to traffic, the remaining half was constructed with the ordinary standard 1:2:3 mix concrete and allowed to set for the required 28 days before being opened to traffic.

[BENTON]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,027.68
Labor and materials furnished by the state:		
Rebuilding guard fence		31.43
Widening roadbed		152.05
Constructing and maintaining detours		44.80
Watchmen and signs for control of traffic		140.34
Connecting with Albany pavement at south end Albany bridge		279.60
Building concrete walk and gravel shoulders in North Albany		841.05
Credit for paving driveway at Frohmader Gas Station near Salem		Cr. 46.66
Contract items as follows:		
Removal of planking, all	$ 100.00	
Excavation, 376.7 cu. yds. at 50c	188.35	
Preparation of subgrade, 8,447.4 sq. yds. at 10c	844.74	
Concrete pavement, 1:2:3 mix, 4,913.45 sq. yds. at $2.20	10,809.59	
Concrete pavement, 1:1:2 mix, 3,533.92 sq. yds. at $3.05	10,778.46	
Extra concrete, 1:2:3 mix. 61.08 cu. yds. at $12.00	732.96	
Extra concrete, 1:1:2 mix, 39.93 cu. yds. at $17.00	678.81	
Expansion joints, 3,934.5 lin. ft. at 10c	339.45	
Bar reinforcement, 4,872.3 lbs. at 6.25c	304.52	
Concrete sidewalk and curb, 1,232.7 lin. ft. at $1.55	1,910.68	
Shoulder material, 129.5 cu. yds. at $1.00	129.50	
Clay-bound gravel embankment, 685.5 cu. yds. at $1.75	1,199.63	
Payhaul in excavation, 196.9 yd. half mi. at 25c	49.23	
Force account items:		
Furnishing and installing curb armour bars	12.60	
Total amount paid to contractor		28,078.52
Grand total cost of project		$ 31,548.81

PARTICIPATION IN COST

State	$31,359.09
Southern Pacific Co.	189.72
Total	$31,548.81

Missouri Bend Surfacing

On the Alsea Highway, from Sta. 2+00, near the Benton-Lincoln County Line, south and east to Sta. 431+00, which station is approximately 4.25 miles west of the town of Alsea; 8.20 miles of broken stone surfacing.

Contract No. 781, awarded March 26, 1925, to Cummings & Wright, of McMinnville, Oregon. Work commenced June 6, 1925; completed October 3, 1925. Final cost, $51,905.06. Resident Engineer, Carl A. Peterson.

The only activity on this project during the biennium consisted of the receipt of $12,364.71 in payment of county cooperation. The final expenditures on the project now stand at $39,540.35 from state funds and $12,364.71 from county funds.

Further details will be found on page 215 of the 1925-26 report.

Gellatly Point-Corvallis Surfacing

On the Corvallis-Newport Highway, from Sta. 600+05.8, at a junction with the existing highway at Gellatly Point approximately 1.2 miles northwest of the town of Wren, to Sta. 539+80, at the west corporate limits of the city of Corvallis. By an equation, Sta. 580+03.4, near the west end of the project, equals Sta. 0+00; 10.60 miles of broken stone surfacing laid in three courses: One course of base material 3.5 inches thick and two courses of top materials each 2.25 inches thick; top width 18 feet, half trenched.

[BENTON]

Contract No. 901, awarded July 29, 1926, to Greenwood & Dann, of Portland, Oregon. Work commenced August 10, 1926; completed July 17, 1927. Final cost, $59,242.16. Resident Engineer, Carl A. Peterson, Corvallis, Oregon.

The specifications for this project provided for the surfacing, with base course material only, of all those portions of the project which were coincident with the old county road and which necessarily had to be disturbed in order to complete the grade during the season of 1926.

As reported in our 1925-1926 report on page 213 this provision of the specifications had been complied with, the contractor having covered all conflicts with base course, which completed 1.1 miles of the project, before closing down operations for the winter. About the middle of April, 1927, the contractor again resumed surfacing operations and rushed the job to completion by July 17, 1927. He maintained a large daily output of crushed stone, which was quarried from the state-owned quarry known as the Mary's River quarry located adjacent to the highway just north of the Noon bridge across Mary's River.

Further details will be found on page 212-13 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,725.92
Labor and materials furnished by the state:		
Prospecting for surfacing materials		163.45
Digging drainage ditches		28.80
Constructing temporary surfacing		1,236.71
Sprinkling surfacing materials		373.26
Constructing and maintaining detour roads		61.50
Maintaining completed portions of surfacing		4,141.76
Contract items as follows:		
Broken stone base, 13,674.0 cu. yds. at $1.74	$23,792.76	
Broken stone top, 12,916.0 cu. yds. at $1.80	23,248.80	
Broken stone for maintenance, 3,289.2 cu. yds. at $1.34	4,407.52	
Earth filler, 56.0 cu. yds. at 30c	16.80	
Filler haul, 204.0 yd. mi. at 22c	44.88	
Total amount paid to contractor		51,510.76
Grand total cost of project		$ 59,242.16

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 2,351.07	$ 1,728.21	$ 4,079.28
Expended 1927-28 biennium	30,023.79	25,139.09	55,162.88
Total of expenditures	$32,374.86	$26,867.30	$ 59,242.16

Missouri Bend-Alsea Mountain Section Surfacing

On the Alsea Highway, from Sta. 431+00, which station is approximately four miles west of the town of Alsea, to Sta. 993+11, equals 1003+40, which station is approximately six miles east of the town of Alsea; 10.68 miles of broken stone surfacing laid in three courses: One course of base material 3.5 inches thick, and two courses of top materials each 2.25 inches thick; top width 16 feet; trenched.

Contract No. 902, awarded July 29, 1926, to Homer G. Johnson, of Corvallis, Oregon. Work commenced August 10, 1926; completed September 10, 1927. Final cost, $82,921.57. Resident Engineer, Carl A. Peterson, Corvallis, Oregon.

[BENTON]

Surfacing material for this project was secured from the state-owned quarry site known as the Seeley quarry, located approximately two miles westerly from the town of Alsea.

On several short sections of this project the new highway followed the old county road very closely, which necessitated the disturbance of the old original surfacing. It was, therefore, specified that the surfacing contractor be required to cover these portions of the project, aggregating approximately 6 miles, with base course before closing down his operations for the winter. This work was successfully done with the exception of a short section approximately three-fourths of a mile in length from the west foot of Alsea Mountain westward, which section, due to the late completion of the grading contract, the surfacing contractor was unable to cover before the early fall rains commenced. As a temporary expedient Contractor Johnson was, therefore, instructed to procure and haul crushed rock of inferior quality from the old quarry near the summit of Alsea Mountain to provide for traffic during the winter.

As early in the spring of 1927 as hauling conditions would permit the contractor again resumed surfacing operations and completed the project on September 10, 1927.

Further details will be found on page 211 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 1,769.27
Labor and materials furnished by the state:		
Temporary surfacing to accommodate travel		1,388.61
Signs for control of traffic		10.80
Sprinkling surfacing materials		361.27
Credit for materials used on adjacent section	Cr.	3,302.00
Contract items as follows:		
Sub-base material, 817.0 cu. yds. at $1.50	$ 1,225.50	
Crushed gravel base, 4,889.25 cu. yds. at $2.20	10,756.35	
Crushed gravel top, 4,142.0 cu. yds. at $2.26	9,360.92	
Base course surfacing, 11,694.0 cu. yds. at $2.35	27,480.90	
Top course surfacing, 7,192.0 cu. yds. at $2.50	17,980.00	
Maintenance materials, 1,512.0 cu. yds. at $2.00	3,024.00	
Hauling maintenance materials, 8,316.0 yd. mi. at 18c	1,496.88	
Earth filler, 1,649.0 cu. yds. at 35c	577.15	
Filler haul, 2,558.5 yd. mi. at 18c	460.53	
Maintenance materials at quarry, 1,720.5 cu. yds. at $2.00	3,441.00	
Force account items:		
Constructing temporary surfacing for winter travel	3,097.79	
Removing trees and stumps from slide at Sta. 557	250.38	
Placing filler in base course, Sta. 950 to 991	261.55	
Missouri Bend Section maintenance materials:		
Maintenance materials, 1,300.0 cu. yds. at $2.00	2,600.00	
Hauling materials, 3,900.0 yd. mi. at 18c	702.00	
Total amount earned by contractor	$82,714.95	
Deduction for industrial rail furnished	21.33	
Total amount paid to contractor		82,693.62
Grand total cost of project		$ 82,921.57

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 8,374.49	$ 3,728.67	$ 12,103.16
Expended 1927-28 biennium	47,489.21	23,329.20	70,818.41
Total expended to date	$55,863.70	$27,057.87	$ 82,921.57

[BENTON]

Alsea Mountain-Philomath Surfacing

On the Alsea Highway, from Sta. 1641+43, which station is at the west end of the bridge over Mary's River, about one-half mile west of the town of Philomath, west to Sta. 1315+80, which station is approximately 12.4 miles east of the town of Alsea; 6.16 miles of broken stone surfacing laid in three courses. One course of sub-base material 6 inches thick, one course of base material 4 inches thick, and one course of top material 1 inch thick; top width 12 feet, bottom width 16 feet; half trenched.

Contract No. 1,028, awarded January 26, 1928, to Homer G. Johnson, of Portland, Oregon. Work commenced April 6, 1928; completed October 10, 1928. Estimated cost, $47,000, consisting of $32,000 from state funds and $15,000 from county funds. Resident Engineer, Carl A. Peterson, Corvallis, Oregon.

As is noted elsewhere in this report this project was awarded with and made a part of the Alsea Mountain resurfacing. The material was secured from the state-owned quarry site known as the Henkle quarry located approximately four miles west of the junction of the Alsea Highway and Corvallis-Newport Highway. The quarry required a considerable amount of stripping of overburden in order to get down to the rock, but when constructed produced a fair quality of surfacing material, which the contractor was able to produce at a rate of approximately 500 cubic yards daily.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,239.49
Purchase of quarry sites		457.00
Laying tile drains, and extending culverts		132.60
Prospecting for surfacing materials		1,177.44
Sprinkling surfacing materials		1,066.28
Placing riprap		105.35
Signs for traffic control		15.54
Contract items as follows:		
Sub-base course surfacing, 9,723.0 cu. yds. at $1.85	$17,987.55	
Base course surfacing, 6,521.0 cu. yds. at $1.85	12,063.85	
Top course surfacing, 1,669.0 cu. yds. at $2.00	3,338.00	
Base course maintenance materials, 472.94 cu. yds. at $1.40	662.12	
Top course maintenance materials, 1,968.95 cu. yds. at $1.50	2,953.40	
Hauling maintenance materials, 1,521.99 yd. mi. at 18c	273.96	
Earth filler, 2,960.0 cu. yds. at 40c	1,184.00	
Filler haul, 5,212.0 yd. mi. at 20c	1,042.40	
Total amount paid to contractor		39,505.28
Grand total expended, 1927-28		$ 44,698.98

PARTICIPATION IN COST

	State	*County*	*Total*
Expended to date	$31,530.55	$13,168.43	$ 44,698.98
Estimated balances to complete	469.45	1,831.57	2,301.02
Estimated total costs	$32,000.00	$15,000.00	$ 47,000.00

Alsea Mountain Section Resurfacing

On the Alsea Highway, from Sta. 1315+80, which station is approximately 12.4 miles east of the town of Alsea, west to Sta. 1003+00, which station is approximately 6.5 miles east of the town of Alsea; 5.88 miles of broken stone resurfacing laid in two courses: One course of base material 4 inches thick and course of top material 2 inches thick; top width 12 feet, bottom width 16 feet.

[BENTON]

Contract No. 1028, awarded January 26, 1928, to Homer G. Johnson, of Portland, Oregon. Work commenced July 28, 1928; completed October 10, 1928. Final cost, $29,407.97. Resident Engineer, Carl A. Peterson, Corvallis, Oregon.

This project was awarded in connection with and as a part of the Alsea Mountain-Philomath surfacing project. Suitable crushed rock was secured from the state-owned quarry known as the Henkle quarry located just south of the Alsea Highway at a point approximately four miles west of the junction of the Alsea and Corvallis-Newport Highways at Philomath.

Before opening up this quarry considerable prospecting work was done in the nature of tunneling and core drilling to estimate the quantity and quality of stone in the quarry, and it developed that the quantity was ample and the quality fair, although it carried a heavy earth overburden, necessitating the removal of some 5,000 to 6,000 cubic yards of earth in order to get to the stone.

Rapid progress was made on this project, the contractor maintaining an average production of approximately 500 cubic yards of crushed material daily.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 666.06
Preparing stock pile sites		20.00
Contract items as follows:		
Base course resurfacing, 5,986.0 cu. yds. at $2.50	$14,965.00	
Top course resurfacing, 3,083.0 cu. yds. at $2.50	7,707.50	
Top course maintenance materials, 2,421.27 cu. yds. at $1.50	3,631.91	
Hauling maintenance materials, 13,430.54 yd. mi. at 18c	2,417.50	
Total amount paid to contractor		28,721.91
Grand total cost of project, all state funds, 1927-28		$ 29,407.97

East Unit, Blodgett-Eddyville Resurfacing

On the Corvallis-Newport Highway, from Blodgett quarry to Kline's Mill; 12.84 miles of crushed rock resurfacing—base course 1½ inch crusher-run crushed stone applied in various thicknesses up to 4 inches loose measure where needed; ¾ inches crusher-run top 4 inches in loose measure.

Contract No. 913, awarded August 26, 1926, to B. C. Seydel Company, assigned to Seydel-Hammel Company, of Portland, Oregon. Work commenced September, 1926; completed April 16, 1928. Estimated cost, $62,000. Resident Engineer, A. A. Amort, Corvallis, Oregon.

At the time the contractors started operations on this project an agreement was had with them that they would go into and open up the state-owned Blodgett quarry site as a source of material for the project. The contractors actually did clear the brush and trees off the site and started to do the work of a preliminary nature, such as driving of coyotes, when a new arrangement was reached wherein material was to be secured from the old, privately-owned Blodgett quarry, and the contractors, therefore, transferred their operations to the old Blodgett quarry.

[BENTON]

Actual resurfacing operations were started in the spring of 1927 and carried on continuously until the late fall of 1927 and completion of the contract.

During the operation of the work the contractors found themselves in financial difficulty, with the result that the work has long since been completed, but some of the outstanding bills against the contractors have not yet been paid, nor has the final payment to the bondsmen and contractors been released at this time.

Further details will be found on page 223 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,542.49
Labor and materials furnished by state:		
Royalties on surfacing materials		2,324.65
Removing slides and cleaning ditches		121.86
Hauling and processing surfacing materials		4,777.80
Sprinkling surfacing materials		947.43
Preparing stock pile sites		79.30
Signs for traffic control		10.90
Maintaining completed portions of roadbed		253.87
Equipment rental deducted from contractor's estimate		20.00
Contract items as follows:		
Base course broken stone, 3,137.0 cu. yds. at $2.54	$ 7,967.98	
Top course broken stone, 13,248.0 cu. yds. at $2.54	33,649.92	
Broken stone maintenance materials, 4,108.0 cu. yds. at $2.54	10,434.32	
Force account items:		
Clearing and developing state-owned quarry	3,303.38	
Total amount earned by contractor	$55,355.60	
Deductions:		
Maintenance material haul adjustment	3,796.95	
Rental of state-owned equipment	20.00	
Final estimate in process of payment	2,027.85	
Total amount paid to contractor		49,510.80
Grand total expended on project, all state funds		$ 59,589.10

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 1,414.53
Expended 1927-28 biennium	58,174.57
Total expenditures	$ 59,589.10
Estimated balance to complete	2,410.90
Total estimated cost	$ 62,000.00

Missouri Bend Grading

On the Alsea Highway, from Sta. 2+00, near the Benton County line, south and east to Sta. 431+00, which station is approximately 4.25 miles west of the town of Alsea; 8.20 miles of grading, Class "B" roadbed.

Contract No. 729, awarded May 28, 1924, to Greenwood & Dann, of Portland, Oregon. Work commenced June 12, 1924; completed July 31, 1926. Final cost, $146,255.13. Resident Engineer, C. A. Peterson.

The only activity on this project during the biennium consisted of the receipt of $17,596.31 in payment of final county cooperation. The final cooperative shares are now $98,658.82 from state funds and $47,596.31 from county funds.

Further details will be found on page 217 of the 1925-26 report.

[BENTON]

Missouri Bend-Alsea Mountain Grading

On the Alsea Highway, from Sta. 431+00, approximately four miles west of the town of Alsea, to Sta. 1003+40, approximately six miles east of the town of Alsea; 10.68 miles of grading, Class "A" 24-foot standard and Class "B" 22-foot standard roadbed.

Contract No. 872, awarded April 29, 1926, to E. L. Gates, of Alsea, Oregon. Work commenced May 10, 1926; completed September 17, 1927. Final cost, $67,897.15. Resident Engineer, Carl A. Peterson, Corvallis, Oregon.

As reported on page 217 of the 1925-1926 biennial report, early fall rains prohibited the contractor from completing his contract during the calendar year of 1926. As this highway accommodates a very heavy traffic it was necessary to postpone the finishing of a short section of the grading until the spring of 1927 in order to carry the traffic. As early in the spring of 1927 as weather conditions would permit the contractor again returned to the job and rushed the grading work to an early completion, the actual grading work being completed in June. However, the final acceptance of the job was not made until September.

Detailed Statement of Expenditures

Engineering		$ 5,836.99
Constructing Mill Creek bridge (county forces)		8,147.57
Labor and materials furnished by the state:		
Construction of drainage ditches		243.26
Riprapping slopes		288.17
Removing slides and cleaning ditches		94.45
Reconstructing pipe lines in town of Alsea		107.85
Signs for control of traffic		6.97
Contract items as follows:		
Clearing and grubbing, all	$ 5,272.50	
Common excavation, 47,822.4 cu. yds. at 33c	15,781.39	
Intermediate excavation, 21,159.9 cu. yds. at 49c	10,368.35	
Solid rock excavation, 6,209.9 cu. yds. at $1.00	6,209.90	
Overhaul, 50,698.0 yd. sta. at 5c	2,534.90	
12-inch concrete pipe, 2,139.0 lin. ft. at $1.06	2,267.34	
18-inch concrete pipe, 405.0 lin. ft. at $2.43	984.15	
24-inch concrete pipe, 243.0 lin. ft. at $3.38	821.34	
36-inch concrete pipe, 72.0 lin. ft. at $6.14	442.08	
Class "A" concrete, 210.48 cu. yds. at $28.00	5,893.44	
Metal reinforcement, 15,980 lbs. at 7c	1,118.60	
6-inch porous drain tile, 1,429.0 lin. ft. at 25c	357.25	
Rock backfill for drains, 263.0 cu. yds. at $2.50	657.50	
Force account items:		
Removing old county bunkers and dangerous trees	79.74	
Tearing up puncheon used as temporary road	73.86	
Removing trees, stumps and roots from slide, Sta. 946	253.26	
Clearing channel of logs and making channel change	56.29	
Total amount paid to contractor		53,171.89
Grand total cost of project		$ 67,897.15

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$28,716.90	$12,834.31	$ 41,551.21
Expended 1927-28 biennium	18,496.20	7,849.74	26,345.94
Total of expenditures	$47,213.10	$20,684.05	$ 67,897.15

[BENTON]

Gellatly Point-Corvallis Grading

On the Corvallis-Newport Highway, from Sta. 600+05.8, at an intersection with the existing highway at Gellatly Point, approximately 1.2 miles northwest of Wren, to Sta. 539+80 at the west city limits of Corvallis. By an equation in stationing near the west end, Sta. 580+03.4 equals Sta. 0+00; 7.30 miles of grading, Class "A" 24-foot roadbed on the heavier portions and 30-foot Class "A" side borrow or grader section on the lighter portions.

Contract No. 870, awarded March 25, 1926, to Slate Construction Co., of Albany, Oregon. Work commenced April 1, 1926; completed July 9, 1927. Final cost, $52,196.62. Resident Engineer, Carl A. Peterson, Corvallis, Oregon.

As reported on pages 218 and 219 of the 1925-1926 biennial report the contractor, Slate Construction Company, completed during the previous biennium all of this grading project with the exception of the two large cuts and fills immediately adjacent to the Wren Overcrossing structure, which was being handled under a separate contract and which structure was not completed until the spring of 1927.

Immediately following the completion of the Wren Overcrossing the contractor moved onto the job and completed the cuts and fills in question early in June.

Detailed Statement of Expenditures

Engineering		$ 3,932.23
Cost of constructing Oak Creek Bridge by county forces		7,330.87
State's share of cost of closing grade crossing		40.37
State's share of royalty on embankment material		142.70
Labor and material furnished by the state:		
Constructing flume at Newton bridge approach		120.89
Lumber for crossing of Spaulding R. R. at Sta. 225		22.46
Maintaining old grade for winter travel		64.29
Constructing drainage ditches		294.66
Removing slides		36.00
Contract items as follows:		
Clearing and grubbing, all	$ 900.00	
Common excavation, 33,947.4 cu. yds. at 30c	10,184.22	
Intermediate excavation, 23,015.0 cu. yds. at 38c	8,745.70	
Solid rock excavation, 9,417.4 cu. yds. at 94c	8,852.36	
Overhaul, 118,231.0 yd. sta. at 5c	5,911.55	
6-inch porous drain tile, 1,407.0 lin. ft. at 15c	211.05	
12-inch concrete culvert pipe, 1,350.0 lin. ft. at $1.10	1,485.00	
18-inch concrete culvert pipe, 252.0 lin. ft. at $1.90	478.80	
24-inch concrete culvert pipe, 432.0 lin. ft. at $2.60	1,123.20	
30-inch concrete culvert pipe, 78.0 lin. ft. at $3.80	296.40	
36-inch concrete culvert pipe, 192.0 lin. ft. at $4.75	912.00	
Rock backfill for drains, 303.0 cu. yds. at $1.00	303.00	
Force account items:		
Removing old iron culverts where required	62.15	
Building flumes to extend culverts	9.38	
Fencing borrow pit, Sta. 250	10.56	
Hauling rock for riprap, Sta. 240 and 595	269.90	
Grading and ditching Main street of Philomath	289.73	
Building wall to hold fill at Wren overcrossing	48.65	
Furnishing rock and building headwalls	118.50	
Total amount paid to contractor		40,212.15
Grand total cost of project		$ 52,196.62

PARTICIPATION IN COST

	State	*County*	*S. P. R. R.*	*Total*
Expended 1925-26 biennium	$15,412.32	$14,140.35	$ 290.00	$ 29,842.67
Expended 1927-28 biennium	12,036.24	8,632.91	1,684.80	22,353.95
Total of expenditures	$27,448.56	$22,773.26	$ 1,974.80	$ 52,196.62

[BENTON]

Digger Creek Bridge

On the Alsea Highway, between Alsea and Waldport; one 60-foot steel span and 269 lineal feet of timber trestle.

Contract No. 742, awarded June 26, 1924, to J. W. Sadler Co., of Portland, Oregon. Work commenced July 15, 1924; completed June 24, 1925. Final cost, $15,601.40. Resident Engineer, O. A. Chase.

This project has been opened during the present biennium only to record the payment of $4,889.87 by Benton County. The final cost now consists of $10,711.53 from state funds and $4,889.87 from county funds.

Further details will be found on page 221 of the 1925-26 report.

Bowers Slough Bridge

On the Albany-Corvallis Highway, 3.53 miles west of Albany; one 36-foot and two 50-foot concrete spans.

Contract No. 862, awarded January 19, 1926, to Jno. W. Ash, of Corvallis, Oregon. Work commenced March 27, 1926; completed September 15, 1926. Final cost, $11,924.20. Resident Engineer, Marshall Dresser.

This project has been opened during the present biennium only to record the payment of $1,390.88 by Benton County. The final cost now consists of $977.06 from state funds and $10,947.14 from county funds.

Further details will be found on page 222 of the 1925-26 report.

Alsea Mountain-Philomath Grading

On the Alsea Highway, from Sta. 1315+80, approximately 6½ miles west of Philomath, to Sta. 1641+43, at the west end of the bridge over Mary's river approximately one-half mile west of Philomath; 6.13 miles of grading, Class "A" 24-foot roadbed.

Contract No. 912, awarded August 26, 1926, to Bullis & Co., of Corvallis, Oregon. Work commenced September 23, 1926; completed October 17, 1927. Final cost, $52,264.42. Resident Engineer, Carl A. Peterson.

This contract was let late in the season of 1927 and there was completed during the winter of 1926-1927 only the clearing, grubbing and building of concrete boxes and pipe culverts, and such of the grading as did not conflict with the old county road over which traffic was to be maintained.

The contractor was delayed slightly on account of right of way difficulties, but moved onto the job as soon as the county had procured the rights of way, doing all the clearing and grubbing and some of the grading before the work was closed down for the winter. Early in the spring of 1927 the contractor again moved onto the job and completed it on October 17, 1927.

It was necessary during the course of construction work in the summer of 1927 to tear up and regrade several short sections where the new highway and the old county road were coincident. In order to carry traffic over these sections during the winter of 1927-1928, and previous to the surfacing of the entire section, arrangements were made with

[BENTON]

Contractor Bullis to cover these conflict sections with bar run gravel secured from several small bars along Greasy Creek. This temporary surfacing material was so placed that it could later be used as sub-base course for the new surfacing work that was to follow.

Further details will be found on page 215 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,998.10
Labor and material furnished by the state:		
Royalties for filler materials taken from the Edwards pit		50.00
Reconstructing Corvallis water pipe line		1,171.27
Prospecting for surfacing materials		52.36
Constructing and maintaining detour roads		95.00
Furnishing signs for the control of traffic		30.00
Contract items as follows:		
Clearing and grubbing, all	$ 500.00	
Common excavation, 39,690.9 cu. yds. at 30c	11,907.27	
Intermediate excavation, 21,294.6 cu. yds. at 41c	8,730.79	
Solid rock excavation, 5,421.1 cu. yds. at 80c	4,336.88	
Overhaul, 77,260.0 yds. sta. at 4c	3,090.40	
12-inch concrete pipe, 750.0 lin. ft. at 95c	712.50	
18-inch concrete pipe, 333.0 lin. ft. at $2.10	699.30	
24-inch concrete pipe, 684.0 lin. ft. at $2.90	1,983.60	
30-inch concrete pipe, 117.0 lin. ft. at $4.10	479.70	
36-inch concrete pipe, 48.0 lin. ft. at $5.70	273.60	
Class "A" concrete, 294.25 cu. yds. at $24.75	7,282.69	
Metal reinforcement, 27,502.0 lbs. at 7c	1,925.14	
6-inch porous drain tile, 180.0 lin. ft. at 15c	27.00	
Rock backfill for drains, 25.0 cu. yds. at $3.40	85.00	
6-inch concrete siphon pipe, 143.0 lin. ft. at $1.05	150.15	
Pit-run gravel sub-base, 3,436.0 cu. yds. at $1.25	4,295.00	
Force account items:		
Clearing channel above Rock Creek bridge	78.86	
Clearing and grubbing borrow pit, Sta. 1431	135.18	
Hauling riprap rock for channel change, Sta. 1461	88.10	
Placing wooden pipe culverts at road crossings	86.53	
Total amount paid to contractor		46,367.39
Grand total cost of project		$ 52,264.42

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 3,750.13	$ 1,719.89	$ 5,470.02
Expended 1927-28 biennium	30,525.18	16,269.22	46,794.40
Total of expenditures	$34,275.31	$17,989.11	$ 52,264.42

Wren Overcrossing

On the Corvallis-Newport Highway, at Wren; 212 lineal feet of reinforced concrete viaduct.

Contract No. 877, awarded April 29, 1926, to D. T. Eaton Construction Co., of Portland, Oregon. Work commenced August 8, 1926; completed April 20, 1927. Final cost, $20,378.07. Resident Engineer, Marshall Dresser to September 6, 1926; then John H. Neef.

This structure carries the Corvallis-Newport Highway over the Southern Pacific tracks near Wren's Station. It is a part of the line revision beginning at the foot of the Hayes Hill grade on the east and rejoining the highway at the mouth of Gellatly Canyon. Besides eliminating the grade crossing at Wren's Station the bridge enables the highway to keep away from the hill between Mary's River and Wren's Station.

Further details will be found on page 219 of the 1925-26 report.

[BENTON]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,717.23
Name plates furnished by the state		33.00
Contract items as follows:		
Excavating to plan elevation, 181.85 cu. yds. at $2.40	$ 436.51	
Excavation below elevation, 117.21 cu. yds. at $3.00	351.63	
Class "A" concrete, 347.2 cu. yds. at $22.00	7,638.40	
Class "D" concrete, 138.554 cu. yds. at $22.40	3,103.61	
Metal reinforcement, 92,776.64 lbs. at 4.75c	4,406.89	
Concrete handrail, 433.5 lin. ft. at $4.00	1,734.00	
Cement adjustment, 22.5 bbls. at $3.57	80.33	
Adjustment account of change in details of construction	500.00	
Force account items:		
Constructing smoke guard on span over tracks	376.47	
Total amount paid to contractor		18,627.84
Grand total cost of structure		$ 20,378.07

PARTICIPATION IN COST

	State	*County*	*Railroad*	*Total*
Expended 1925-26 biennium	$ 5,473.57	$ 4,480.60	$	$ 9,954.17
Expended 1927-28 biennium	3,447.58	2,690.32	4,286.00	10,423.90
Total of expenditures	$ 8,921.15	$ 7,170.92	$ 4,286.00	$ 20,378.07

Timber Revetment near Corvallis

Adjacent to the Albany-Corvallis Highway, at a point about one-quarter of a mile north of the north corporate limit of the city of Corvallis, on the west bank of the Willamette River.

Contract No. 1,003, awarded September 27, 1927, to Leander Lebeck, of Portland, Oregon. Work commenced October 15, 1927; completed December 10, 1927. Final cost, $8,024.98. Resident Engineer, A. A. Amort.

This project consisted of a driven pile timber revetment 470.4 feet in length parallel to the pavement of the Albany-Corvallis Highway in the clay cut bank of the Willamette River near the northern corporate limits of the city of Corvallis.

For several years past, freshets of the Willamette River have been gradually eroding the bank to such an extent that late in 1927 it was decided that the revetting of the bank was necessary. Satisfactory progress was made on the work, the contractor being able to complete the entire job by December 10, there having been no serious floods during his operations.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 218.12
Backfilling behind timber revetment		1,694.76
Contract items as follows:		
Timber piling, 5,219.9 lin. ft. at 60c	$ 3,131.94	
Lumber and timber, 51.382 M-FBM at $58.00	2,980.16	
Total amount paid to contractor		6,112.10
Grand total expended, all state funds, 1927-28		$ 8,024.98

[BENTON]

Mary's River Bridge

On the Corvallis-Newport Highway, 1.8 miles west of Philomath; one 100-foot steel span and eight 19-foot timber trestle spans.

Contract No. 878, awarded April 29, 1926, to D. T. Eaton Construction Co., of Portland, Oregon. Work commenced June 5, 1926; completed April 15, 1927. Final cost, $15,572.44. Resident Engineer, Marshall Dresser to September 6; then John H. Neef.

This structure is on the line revision between the foot of Hayes Hill and Gellatly Canyon. It replaces a wooden bridge across Mary's River, built several years ago by Benton County.

Further details will be found on page 219 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,112.84
Bronze name plates furnished by the state		33.00
Contract items as follows:		
Excavation to plan elevation, 153.12 cu. yds. at $2.10	$ 321.55	
Excavation below plan elevation, 25.4 cu. yds. at $2.75	69.85	
Class "B" concrete, 110.4 cu. yds. at $17.95	1,981.68	
Class "D" concrete, 46.625 cu. yds. at $20.50	955.81	
Lumber and timber, 10.266 M-FBM at $44.00	451.70	
Metal reinforcement, 11,845.75 lbs. at 4.75c	562.67	
Trestle superstructure, 155 1/3 lin. ft. at $13.25	2,058.17	
Structural steel, 106,886 lbs. at 7.45c	7,963.01	
Cement adjustment, 1.25 bbls. at $3.44	4.30	
Force account items:		
Furnishing and placing dummy expansion joints	49.71	
Labor involved in removing dangerous tree	8.15	
Total amount paid to contractor		14,426.60
Grand total cost of structure		$ 15,572.44

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 5,807.02	$ 5,126.22	$ 10,933.24
Expended 1927-28 biennium	2,552.12	2,087.08	4,639.20
Total of expenditures	$ 8,359.14	$ 7,213.30	$ 15,572.44

North Fork of Alsea River Bridge

On the Alsea Highway, near Alsea; one 30-foot concrete span, one 100-foot steel span and one 40-foot concrete span.

Contract No. 905, awarded July 29, 1926, to Stephens & Bolderson, of Alsea, Oregon. Work commenced August 8, 1926; completed May 10, 1927. Final cost, $18,504.64. Resident Engineer, John H. Neef.

This bridge replaces an old wooden truss, and is built on alignment eliminating a bad curve on each end of the old structure. The contractors defaulted on their contract before structure was completed, and with the consent of the bonding company the structure was completed by state forces under the direction of E. G. Ricketts. The cost of the work done by state forces was deducted from the amount due under the contract.

Further details will be found on page 219 of the 1925-26 report.

[BENTON]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,525.43
Bronze name plates furnished by the state		28.78
Expended by state for completing structure		1,144.51
Contract items as follows:		
Excavation to plan elevation, 85.54 cu. yds. at $1.00	$ 85.54	
Excavation below plan elevation, 70.23 cu. yds. at $5.00	351.15	
Class "A" concrete, 66.093 cu. yds. at $26.00	1,718.42	
Class "B" concrete, 73.493 cu. yds. at $22.00	1,616.86	
Class "D" concrete, 115.313 cu. yds. at $20.00	2,306.26	
Metal reinforcement, 38,527.61 lbs. at 7c	2,696.93	
Structural steel, 104,842 lbs. at 7c	7,338.94	
Concrete handrail, 148.166 lin. ft. at $5.00	740.83	
Cement adjustment, 15.75 bbls. at $4.68	73.71	
Total amount earned by contractor	$16,928.64	
Deduction for incompleted portion of contract	1,122.72	
Total amount paid to contractor		15,805.92
Grand total cost of structure		$ 18,504.64

PARTICIPATION IN COST

	State	County	Total
Expended 1925-26 biennium	$ 3,597.03	$ 1,518.19	$ 5,115.22
Expended 1927-28 biennium	9,264.73	4,124.69	13,389.42
Total of expenditures	$12,861.76	$ 5,642.88	$ 18,504.64

Rock Creek Bridge

On the Alsea Highway, approximately four miles west of Philomath; four 30-foot reinforced concrete spans.

Contract No. 954, awarded March 3, 1927, to Clackamas Construction Co., of Portland, Oregon. Work commenced March 11, 1927; completed June 29, 1927. Final cost, $9,118.39. Resident Engineer, Christ Fauerso.

This structure replaced an old 76-foot wooden span with two 19-foot trestle approach spans. The design of this bridge is different from the usual concrete bridge design in that all expansion joints have been eliminated. This type of design allows advantage to be taken of continuity over supports and effects a large saving in materials.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 908.98
Footing sheathing furnished by the state		29.57
Contract items as follows:		
Excavation to plan elevation, 255.6 cu. yds. at $2.00	$ 511.20	
Excavation below elevation shown, 23.6 cu. yds. at $4.00	94.40	
Class "A" concrete, 124.9 cu. yds. at $22.00	2,747.80	
Class "D" concrete, 83.39 cu. yds. at $22.00	1,834.58	
Metal reinforcement, 39,709.0 lbs. at 5c	1,985.45	
Concrete handrail, 250.66 lin. ft. at $4.00	1,002.64	
Force account items:		
Changing column forms and footings and water-proofing joints on top of wing wall footings	53.05	
Total amount earned by contractor	$ 8,229.12	
Deduction for cement adjustment	49.28	
Total amount paid to contractor		8,179.84
Total cost of project, 1927-28		$ 9,118.39

PARTICIPATION IN COST

State	$ 6,381.92
County	2,736.47
Total	$ 9,118.39

[BENTON]

Maintenance

During the past biennium all maintenance work on state highways in Benton County that has been completed to state standards has been carried on by the state with its own forces and equipment. This work has consisted of the general maintenance of pavements, macadams, grades, shoulders, ditches, roadbeds and rights of way and all other general work necessary in the maintenance of a state highway system, under the direction and supervision of J. S. Sawyer, Division Engineer, Salem, Oregon, and Albert A. Amort, Resident Engineer, Corvallis, Oregon.

The sections upon which funds have been expended for work in Benton County are as follows:

West Side Pacific Highway from the Polk-Benton County line to the Benton-Lane county line; Corvallis-Newport Highway from Corvallis to the Benton-Lincoln county line; Alsea Highway from its junction with the Corvallis-Newport Highway at Philomath to the Benton-Lincoln County line at Little Digger Mountain; Albany-Corvallis Highway from Albany to Corvallis.

The total mileage in Benton County under maintenance by the state at this time is 91.4 miles, of which approximately 40 miles are paved with concrete or bituminous pavement and the remaining 52 miles are macadam and oiled macadam.

Under the classification of betterment work done in Benton County during the past biennium some of the most important work consists of the widening of the Corvallis-Newport Highway from Blodgett quarry to the Lincoln county line; the revetting of a short strip of the river bank of the Willamette River along the Albany-Corvallis Highway just out of Corvallis and the resurfacing of the Blodgett quarry to Lincoln County line section of the Corvallis-Newport Highway.

Missouri Bend Maintenance Materials

These materials were secured under the contract for the Missouri Bend-Alsea Mountain surfacing project which is described in another article in this report. A total of 1,300 cubic yards of materials were stock piled on the Missouri Bend section for future maintenance use. The total cost of these materials amounted to $3,302 and credit for that amount was given to the Missouri Bend-Alsea Mountain section.

Corvallis Maintenance Headquarters Site

For future maintenance needs it was deemed advisable during this biennium to select and purchase a site for maintenance headquarters at or near Corvallis.

After carefully looking over the situation, both as regards accessibility of location and cost of property, a location in the city of Corvallis, on the northeast corner of Second and B streets in Avery's Addition was selected, consisting of Lots 10, 11 and 12, which lots are served by the Southern Pacific Railroad industrial spur.

[BENTON]

Since the property was acquired it has been improved by the construction of a low, concrete retaining wall along the railroad frontage, and the filling of practically the entire lots, which work was done with state forces and equipment. The filling material was secured for the cost of hauling from basement excavations in and around Corvallis at a very economical figure.

It is planned that a maintenance headquarters building be erected on the site in the near future.

The improvement on this maintenance headquarters site has been carried on under the direction of A. A. Amort, Resident Engineer, Corvallis, Oregon.

Blodgett Quarry and Park Site

On the Corvallis-Newport Highway, three miles east of Blodgett; 10 acres in area.

This site was secured during the previous biennium and a descriptive article will be found on page 213 of the last report.

During the present biennium, additional expenditures of $49.90 have been made, bringing the total expenditures to date $83.40.

CLACKAMAS COUNTY

During the two-year period ending with the close of 1928, the principal item of construction work undertaken in Clackamas County, and the only one of any importance, has been the major betterment reconstruction of the Canemah-New Era section of the Pacific Highway. This project, when completed, will provide a highway of high standard grade and alignment, and will remove from the route of the Pacific Highway traffic the condition which has made that section of the road known as the "bottle neck" of the Pacific Highway.

On the Mt. Hood Highway the past two years have seen a very material increase in traffic during the winter months because of the increased use of the Mt. Hood area for winter sports. Beginning with the winter of 1926-27 the highway has been maintained open by removal of the snow throughout the winter as far as Government Camp, and the amount of traffic which has used the highway during the season of snow removal has seemed to fully justify the expense.

During 1927 and 1928 the oiling of the Mt. Hood Highway has been continued and increased in standard by the use of some of the bituminous macadam specifications which have been recently developed, so that at the end of 1928 the road surface is in excellent condition throughout the county. The section from Rhododendron to the Hood River County line, however, has as yet only a light oil surface treatment, since a considerable part of that distance is either under process of widening and regrading or in early prospect of such improvement. State work in the county during the biennium has been under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem.

Oregon City-Canemah Paving

On the Pacific Highway, from Sta. 7+16, which station is at the east end of the pavement on Fifth street in Oregon City, south to mile post 14.61, at the north end of the pavement on Main street in the town of Canemah; 0.82 mile of concrete pavement, 20 feet wide, seven inches thick at the center and nine inches thick at the edges; the extra thickness being obtained within the last three feet at the edges.

Contract No. 849, awarded September 15, 1925, to the Oregon Contract Co., of Portland, Oregon. Work commenced October 5, 1925; completed December 5, 1925. Final cost, $28,418.02. Resident Engineer, F. T. Young.

This project has been opened during the present biennium only to record the receipt of $2,255 as final cooperative payment from Oregon City. The final cost now consists of $14,372.14 state funds, $2,459.27 city funds, and $11,586.58 from local industries.

Further details will be found on page 225 of the 1925-26 report.

Oregon City-Canemah Gap Paving

On the Pacific Highway, from Sta. 30+94, which station is approximately 0.7 mile south of the undercrossing of the Southern Pacific Railroad tracks in Oregon City, to Sta. 38+50, which station is at the north

end of the town of Canemah; 756 lineal feet of concrete paving, 10 feet wide, seven inches thick at the edge which adjoins the existing half-width strip of pavement, nine inches thick at the outside edge, the extra thickness being obtained in the outer three feet.

Contract No. 1,045, awarded July 2, 1928, to Rigdon Brothers, of Woodburn, Oregon. Work commenced July 10, 1928; completed July 13, 1928. Final cost, $2,092.12. Resident Engineer, F. T. Young.

This job consisted in paving the half-width gap which was left unpaved when the Oregon City-Canemah section was paved in 1925 and which was covered with a laminated plank surface as noted on page 226 of the biennial report for 1925-1926.

In order to provide a tie between the pavement and a combined gutter and curb, which it is anticipated may be constructed in the future, tie bars were installed in the outer edge of the pavement. These consist of one-half-inch square deformed bars, 36 inches in length and projecting half their length.

Further details will be found on page 225 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 51.75
Widening roadbed		41.96
Contract items as follows:		
Portland cement concrete pavement, 865.87 sq. yds. at $2.20	$ 1,904.91	
Removal of planking, all	30.00	
Expansion joints, 391.0 lin. ft. at 10c	39.10	
Steel tie bars, 488.0 lbs. at 5c	24.40	
Total amount paid to contractor		1,998.41
Grand total cost of project, all state funds, 1927-28		$ 2,092.12

Pavement Widening at Barlow

On the Pacific Highway, from Mile Post 24.09, at Sta. 88+62, south to Mile Post 24.31, at Sta. 100+42.5; in the vicinity of Barlow; widening of the original 16-foot concrete pavement by the addition of a 10-foot strip of concrete pavement on the easterly side.

Contract No. 959, awarded March 29, 1928, to W. W. Head Construction Company, of Eugene, Oregon. Work commenced on Barlow section May 9, 1928; completed May 12, 1928. Resident Engineer, F. T. Young.

One of the major betterments in Clackamas County was the widening of the Pacific Highway pavement at Barlow from a point where the highway right of way begins, immediately adjacent to the Southern Pacific right of way south of the Molalla River, southerly for a distance of about 1,180 feet to a short, sharp, reverse curve where there is a jog in the railroad right of way. This widening consisted of the construction of a 10-foot strip along the easterly side of the existing pavement whereby an entire elimination of the reverse curve was made possible, as well as a lightening of the simple curve at the northerly end of the project. This work was done under a contract which included a number of small gaps in Benton, Linn and Marion Counties, and a detailed statement of cost of the work is to be found in the paragraph relating to the work in the Benton County section of this report.

[CLACKAMAS]

Canemah-New Era Grade Widening and Resurfacing

On the Pacific Highway, from Sta. 220+46.2, which station is near the south edge of the town of Canemah, south to Sta. 27+00, which station is approximately one-half mile south of the town of New Era. By an equation, Sta. 0+00 north equals 0+00 south at Parrot Creek; 4.68 miles of grade widening, roadbed widened to a minimum of 36 feet; and 2.37 miles of resurfacing.

Contract No. 1,029, awarded January 26, 1928, to John Slotte & Co., of Astoria, Oregon. Work commenced February 6, 1928. Estimated cost, $160,000, consisting of $84,871.97 from state funds and $75,128.03 from government funds. Expenditures to date, $115,421.34, composed of $67,379.71 from state funds and $48,041.63 from government funds. Resident Engineer, F. T. Young.

The section of the Pacific Highway from Canemah to New Era, constructed in 1927 and 1928, has long been generally known and called the "bottle neck" of the Pacific Highway, because its location along the bluffs of the Willamette River is crowded in many places between the railroad track of the Southern Pacific Company and the precipitous rock bluffs, and the standards of construction current at the time of its construction resulted in a crooked alignment and a roadbed barely wide enough to carry the 16-foot width of pavement which was constructed upon it without sufficient width for adequate drainage and with no opportunity whatever for traffic to get off the pavement when it was necesary to make a stop.

The original pavement was a light two-inch Warrenite type laid upon an inadequate rock base and constructed upon an unsettled roadbed and was a continually increasing source of expense for maintenance because too light to carry the traffic to which it has been subjected.

The reconstruction of this section of approximately 4.7 miles, from Canemah to the top of the hill just south of New Era, was, therefore, undertaken as one of the early major reconstruction projects, in what it is anticipated will be a continuing conservative program of reconstruction of those sections of the highways built in the early days of Oregon's highway development which have proved insufficient for present-day requirements.

In connection with this project a number of alterations in the plans, aggregating about one-third increase in the total cost of the project, have been made at the request of and to be paid for by the Southern Pacific Company in order to provide for the future double tracking of that company's track. These changes have consisted of a relocation of the highway further away from the track at those places where the old highway was immediately adjacent to the railroad right of way and so close to the track as to prevent the construction of a second track.

At the close of the biennium approximately 4.5 miles of the regrading has been completed and it is expected that the entire contract will be finished early in 1929.

Temporary macadam surfacing is being constructed on those sections of the project where the old pavement has been removed or covered up or otherwise made impractical for use, until the new pavement is laid.

[CLACKAMAS]

Canby-Aurora Roadbed Widening

On the Pacific Highway, from Mile Post 22.40, in the town of Canby, to Mile Post 26.40, which point is at the south end of the south embankment approach to the Pudding River Crossing at Aurora; four miles of grade widening; roadbed widened to a minimum of 32 feet.

Contract No. 890, awarded June 24, 1926, to Shaffer Bros., of Portland, Oregon. Work commenced July 9, 1926; completed October 18, 1926. Final cost, $18,635.24. Resident Engineer, F. T. Young.

During the current biennium the features of the project, which were not included in the contract, have been completed by state forces. These consisted of an extension of either end of the concrete box culvert near the foot of Bergeson Hill, the reconstruction of gravel shoulders along the pavement and the construction of guard fences and special box drains along the shoulders of the new fills, none of which features of the project require any special comment.

Further details will be found on page 229 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,584.52
Labor and materials furnished by the state:		
Royalty paid for borrow materials		250.00
Installing wooden flumes and gutters along fill		387.71
Rebuilding guard fence		72.37
Removing slides, cleaning ditches, leveling and seeding shoulders		943.61
Extending culverts		1,147.25
Rental of state equipment deducted from contractor's estimate		76.70
Contract items as follows:		
Excavation, single classification, 26,765.4 cu. yds. at 50c	$13,382.70	
12-inch corrugated iron pipe, 38.0 lin. ft. at $1.70	64.60	
18-inch corrugated iron pipe, 12.0 lin. ft. at $2.50	30.00	
24-inch corrugated iron pipe, 32.0 lin. ft. at $3.30	105.60	
Class "C" concrete, 15.87 cu. yds. at $24.00	380.88	
Extra material haul, 360.0 yd. half mile at 10c	36.00	
Clearing and grubbing, 0.5 acre at $500.00	250.00	
Total amount earned by contractor	$14,249.78	
Deduction for rental of state-owned equipment	76.70	
Total amount paid to contractor		14,173.08
Grand total cost of project, all state funds		$ 18,635.24

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$15,917.55
Expended 1927-28 biennium	2,717.69
Total of expenditures	$18,635.24

Mt. Hood Loop Forest Road Project, Widening

Upon completion of the construction of the forest road sections on the Mt. Hood Loop, it was found that the standards used were not of high enough quality to provide for present traffic. For this reason a reconstruction program was undertaken in May of 1926 by the Bureau of Public Roads, the work being handled by day labor. Widening operations began at the forest boundary at the Zig Zag Ranger Station and progressed easterly. Funds were available for both the years 1926 and 1927, during which time widening operations were carried out to a point about midway of Laurel Hill. Some work also was done in the vicinity

[CLACKAMAS]

of Government Camp and Swim, in order to provide more parking space for vehicles taking people to the mountain for winter sports. Due to the uncertainty of state funds in 1928 and the inability to provide co-operative funds the project was temporarily abandoned.

The total cost of the work done to date has amounted to $115,620.41. These expenditures have been made entirely from government funds.

Further details will be found on page 227 of the 1925-26 report.

Parrott Creek Bridge

Federal Aid Project No. 132-A

On the Pacific Highway, at New Era; three 30-foot, one 60-foot and three 30-foot reinforced concrete spans.

Contract No. 1,010, awarded November 16, 1927, to Rigdon Brothers, of Woodburn, Oregon. Work commenced November 16, 1927; completed November 1, 1928. Estimated cost, $35,000. Resident Engineer, J. T. Skelton.

This structure is continuous without an expansion joint over all supports. In order to take the greatest possible advantage of the economy of this type of design, excavations were made by state forces for all footings. This bridge, which has a 27-foot roadway and two 4½-foot sidewalks, replaces an old narrow wooden bridge.

This bridge was completed in 1928, but final settlement had not been made with the contractor at the close of the biennium.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,814.16
Labor and material furnished by the state:		
Foundation investigation		972.23
Reinforcing wing wall		764..07
Bronze name plates		19.18
Contract items as follows:		
Excavation to plan elevation, 957.0 cu. yds. at $1.50	$ 1,435.50	
Excavation below elevation, 62.0 cu. yds. at $3.00	186.00	
Class "A" concrete, 662.0 cu. yds. at $20.50	13,571.00	
Class "D" concrete, 206.68 cu. yds. at $20.50	4,236.94	
Metal reinforcement, 164,805 lbs. at 3½c	5,768.18	
Concrete handrail, 492.17 lin. ft. at $5.00	2,460.85	
Removal of old bridge and maintenance of traffic	1,440.00	
Metal reinforcement on hand, 200 lbs. at 2.28c	4.56	
Force account items:		
Test loading wing footing in bent No. 8	29.86	
Extra expense due to raising grade of bridge	153.48	
Copper water stops in wing walls	71.80	
Asphalting joints between wing walls and columns	9.74	
Extra expense to take extensometer readings	125.43	
Placing dry masonry walls between columns in bents 1 and 8	248.37	
Total amount earned by contractor	$29,741.71	
Deduction for retained percentage	892.25	
Total amount paid to contractor		28,849.46
Grand total expended on structure 1927-28		$ 33,419.10

PARTICIPATION IN COST

	State	*Government*	*Total*
Total expended to date	$16,514.31	$16,904.79	$ 33,419.10
Estimated cost to complete	Cr. 1,165.81	2,746.71	1,580.90
Estimated total cost	$15,348.50	$19,651.50	$ 35,000.00

Maintenance

Maintenance operations on those sections of highways which are paved are almost entirely confined to such ordinary and routine work as the maintenance of roadbed and shoulders, by occasional blading of the shoulders and finally renewal of shoulder material, mowing of grass, weeds, etc., cleaning of ditches and culverts, repair of guard fences and signs, and the work necessary to maintain the pavement surface, such as sanding of bituminous pavements in the summer and filling of cracks and expansion joints in concrete pavements in the fall, together with such repairs and breaks as may be necessary. Such has been the case on the Pacific Highway in Clackamas County.

Expenditures for maintenance and betterment work on the Mt. Hood Highway has been for oiling and construction of bituminous macadam surfacing. The entire length of the highway in Clackamas County has been oiled or redressed with bituminous macadam, of which more detailed specifications will be found in the general section on maintenance of this report.

Maintenance work in Clackamas County has been under the field direction of F. T. Young, Resident Engineer, with headquarters at Oregon City, in 1927, and of F. D. Eason, Resident Engineer, with headquarters at McMinnville, in 1928.

Mt. Hood-Clear Lake Forest Road Maintenance

This maintenance was done under an agreement with the federal government covering the Mt. Hood-Clear Lake Forest Road Project, whereby the state was obliged to cooperate with the government to the extent of 50 per cent of the cost of the maintenance for a period of two years following the completion of the construction. Under this agreement additional state funds to the amount of $776.13 have been expended during the biennium now closing. This brings the total cost of the maintenance to $3,692.28, of which the state has paid one-half and the federal government one-half.

Further details will be found on page 227 of the 1925-26 report.

Canemah Maintenance Station

On the Pacific Highway, at Mile Post 14.85; purchase of property and construction of building.

Contract No. 897, awarded June 24, 1926, to W. G. H. Krueger, of Oregon City, Oregon. Final cost, $2,106.50. Expenditures this biennium, $1,347.94. Resident Engineer, F. T. Young.

The construction of the Canemah Maintenance Station was completed in 1926, as noted on page 230 of the report for 1925-1926. Expenditures since the beginning of the present biennium have consisted of final payment to the contractor of building construction and painting the building, which was not included in the construction contract.

Further details will be found on page 230 of the 1925-26 report.

[CLACKAMAS]

Multnomah County Line-Beaver Creek Maintenance Materials

On the Mt. Hood Highway, from Mile Post 19.02, at the Multnomah-Clackamas County line, to Mile Post 29.0, approximately 3.6 miles east of Sandy; maintenance material in stock piles.

Contract No. 948, awarded March 3, 1927, to Peterson and Scott, of Portland, Oregon. Work commenced April 29, 1927; completed July 29, 1927. Final cost, $19,623.34. Resident Engineer, F. T. Young.

This contract provided for furnishing crushed gravel for oiling and bituminous macadam surfacing. The material was Willamette River gravel shipped from the plant of the Ross Island Sand and Gravel Company at Portland, and stock-piled at convenient points along the section.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 753.17
Lease of stock pile sites		319.25
Hauling and processing surfacing materials		498.50
Credit for materials used in bituminous macadam construction		Cr. 8,661.58
Contract items as follows:		
Grade "A" materials in stock pile, 1,459.0 cu. yds. at $2.40	$ 3,501.60	
Grade "B" materials in stock pile, 1,507.0 cu. yds. at $2.40	3,616.80	
Grade "C" materials in stock pile, 1,058.0 cu. yds. at $2.40	2,539.20	
Grade "D" materials in stock pile, 2,828.0 cu. yds. at $2.10	5,938.80	
Grade "E" materials in stock pile, 628.0 cu. yds. at $2.10	1,318.80	
Grades "A-B-C" materials in trucks, 1,039.0 cu. yds. at $2.20	2,285.80	
Hauling maintenance materials, 30,647.0 yd. mi. at 20c	6,129.40	
Force account items:		
Clearing and grading stock pile sites	211.24	
Building bins for storing maintenance materials	774.13	
Constructing plank road to stock pile sites	398.23	
Total amount paid to contractor		26,714.00
Grand total cost of project, all state funds, 1927-28		$ 19,623.34

Beaver Creek-Rhododendron Maintenance Materials and Resurfacing

On the Mt. Hood Highway, from Mile Post 29.0, approximately 3.6 miles east of Sandy, to Mile Post 46.0, approximately 0.8 mile east of Rhododendron; 2.12 miles of broken stone resurfacing, consisting of 4,151 cubic yards of road materials; and 16,788 cubic yards of maintenance material in stock piles.

Contract No. 955, awarded March 4, 1927, to Newport Construction Co., of Portland. Work commenced March 14, 1927; completed October 6, 1927. Final cost, $43,095.82. Resident Engineer, F. T. Young.

To provide for the program of oiling and bituminous macadam construction contemplated for the season of 1928 on the Mt. Hood Highway from Sandy to Rhododendron, as well as to provide maintenance material for the maintenance and repair of that section of the highway both before and after such oiling and bituminous macadam construction, contracts were let in the spring of 1927 for furnishing of the necessary crushed rock and gravel. For the section from Beaver Creek to Rhododendron the use of crushed rock was contemplated, to be secured from a rock deposit on the Salmon River about three-quarter mile south of the highway and about one mile east of Brightwood.

[CLACKAMAS]

In connection with this contract, material was also furnished for some resurfacing work which was found necessary due to inadequate macadam and/or poor subgrade conditions. This resurfacing, aggregating approximately 2.12 miles, comprised the following section: Mile Post 37.38 to 38.14; Mile Post 39.48 to 40.22; Mile Post 45.45 to 45.70, and several scattered short sections of a few hundred feet in length.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,185.56
Purchase of stock pile sites		233.80
Prospecting for surfacing materials		233.68
Hauling and placing surfacing materials		791.76
Credit for materials used in bituminous macadam construction		Cr. 12,319.87
Contract items as follows:		
Grade "A" materials in stock piles, 3,361 cu. yds. at $2.025	$ 6,806.03	
Grade "B" materials in stock piles, 3,146 cu. yds. at $2.025	6,370.65	
Grade "C" materials in stock piles, 4,414.0 cu. yds. at $2.025	8,999.10	
Grade "D" materials in stock piles, 4,189.0 cu. yds. at $1.725	7,226.03	
Grade "E" materials in stock piles, 2,579.0 cu. yds. at $1.725	4,448.78	
Grade "X" materials in stock piles, 209 cu. yds. at $1.425	297.83	
Grade "A" materials in trucks, 1,212 cu. yds. at $1.725	2,090.70	
Grade "B" materials in trucks, 320 cu. yds. at $1.725	552.00	
Grade "C" materials in trucks, 20 cu. yds. at $1.725	34.50	
Grade "D" materials in trucks, 799 cu. yds. at $1.725	1,378.28	
Grade "E" materials in trucks, 446 cu. yds. at $1.725	769.35	
Grade "X" materials in trucks, 214 cu. yds. at $1.425	304.95	
Hauling materials, 60,206 yd. mi. at 18c	10,837.08	
Force account items:		
Clearing and leveling stock pile sites	874.62	
Constructing board partitions between piles	968.41	
Building road from highway to stock piles	12.58	
Total amount paid to contractor		51,970.89
Grand total cost of project, all state funds, 1927-28		$ 43,095.82

Bluff Tract Between Oregon City and Canemah

On the Pacific Highway, at the south city limits of Oregon City.

With a view to future development and improvement of the so-called Bluff Tract between Oregon City and Canemah, a preliminary survey and study of the tract was made in 1927 and the property was acquired. No work has been undertaken as yet other than this preliminary study, but the attractiveness of the tract from a scenic standpoint will sooner or later require its development so as to make it more readily available to the public.

Additional expenditures of $200.19 during the present biennium bring the total state funds expended to $2,312.19,

Further details will be found on page 232 of the 1925-26 report.

Canemah-Aurora Right of Way

On the Pacific Highway.

In completing the acquisition of additional rights of way for the Canemah-New Era and Canby-Aurora sections, begun in 1926 as noted on page 231 of the report for 1925-1926, additional expenditures have been made during the biennium just ended in the amount of $3,429.79.

[CLACKAMAS]

These expenditures have, in part, been for the widening of the original right of way which had been settled for at the date of the last report, and in part for additional rights of way on account of revisions in the line which have since been made in further improving the alignment, particularly between Canemah and New Era.

Further details will be found on page 231 of the 1925-26 report.

Sandy Maintenance Station

On the Mt. Hood Highway, at Sandy.

Property for a maintenance station at Sandy has been acquired from Mrs. Emma V. Miller. The tract, 100 by 196.8 feet, average length, comprises Lots 4 and 5 in Block 1 of Sandy, together with the unplatted parcel lying south of those lots between them and the highway. This transaction was completed shortly before the close of the year 1928 and construction of the station building has not been undertaken as yet. Expenditures for the site have amounted to $690 from state funds.

Government Camp Maintenance Station

On the Mt. Hood Highway, at Government Camp.

With the effort succesfully made in the winter of 1926-1927 to maintain the Mt. Hood Highway clear of snow as far as Government Camp, and the demonstration that the road could be kept open and would be used if open, it became evident that there would be a prevailing demand that the road be kept open every year. With that prospect it was also apparent that a permanent maintenance station at Government Camp would be required to properly protect and house equipment and men. The construction of a building was, therefore, undertaken on property at Government Camp acquired for the purpose and the work was done by state forces. To avoid so great loss of heat as is experienced in cold weather from a metal-sheathed building, wooden construction throughout was adopted, in lieu of the sheet iron roof and sides, which have been used for the maintenance station buildings in other parts of the state.

The building is 28 by 72 feet in area, divided into three sections: A two-bay unfloored cold storage section, a three-bay cement floored, heated storage and work shop section, and a one-bay sleeping quarters for extra help fitted with toilet and shower bath. The station is located on Lots 7 and 8 in Block 5 of the town site of Pompeii.

Expenditures during the biennium have amounted to $6,532.16 from state funds.

Mt. Hood Highway Right of Way

On the Mt. Hood Highway.

During the biennium just ended further progress was made on the widening of the Mt. Hood Loop Highway east from the Forest Boundary and in connection therewith additional width of right of way has been acquired through privately owned lands within the forest reserve. This part of the betterment project has not yet been completed and it will be

necessary to acquire additional right of way through other properties, particularly in the vicinities of Bear Creek and Government Camp, before the entire project is completed. Expenditures during the 1927-1928 biennium for this purpose have amounted to $3,404.99. Total expenditures to date have amounted to $6,231.23.

Further details will be found on page 231 of the 1925-26 report.

Oswego-Multnomah County Line Survey

In anticipation of the necessity for replacement of the Tryon Creek bridge at Oswego, a survey was made in 1927 for a revision of the location between Oswego and the Multnomah County line. This survey provides a slightly changed location for the new bridge in case the present structure should be replaced by another bridge, and also contemplates the possibility of the construction of a culvert and fill in lieu of a bridge. This latter alternate would require the cooperation of the Southern Pacific Company in a joint project for a similar replacement of the trestle of that company, which parallels the highway at that point. This situation will require further study before a final plan can be determined upon and the survey job will be continued into the succeeding biennium.

The survey covers approximately 0.9 mile south from the Multnomah County line and has been made by F. T. Young, Resident Engineer.

Canemah-New Era Survey

During the biennium just ended the survey for the reconstruction of the Canemah-Canby section of the Pacific Highway in Clackamas County, begun in 1923 and continued in 1925-1926, has been further continued in revisions at New Era and north from there. These revisions have been in part necessitated to accommodate the future development of the Southern Pacific Company and in part to give a better standard of alignment and/or grade for the highway. As regards the section north of New Era the survey work as distinguished from construction engineering has been terminated by commencement of construction work during 1928, but in the section south of New Era the status of the ultimate location is the same as two years ago and, in all probability, further surveys will be necessary before a final decision is made.

This survey has covered a distance of 6.10 miles from Canemah to a point 0.9 mile north of Canby, and has been under the direction of F. T. Young, Resident Engineer.

CLATSOP COUNTY

With the completion during the preceding biennium of the section of the Roosevelt Coast Highway between Cannon Beach Junction and Hamlet Junction, the state highway system in Clatsop County was finished, so far as original construction is concerned, with the exception of one short gap where a new bridge is yet to be built across the Necanicum River about two miles south of Seaside. So, in the period of 1927 and 1928, there has been no new construction in this county.

Because of the fact, however, that much of the original construction was done in the early years of the development of our state highways and upon standards very much inferior to those current at the present time, it has been natural that some of the first major betterment reconstruction projects to be planned should be in this county. The first of these, on the Astoria-Svensen section, was also completed in 1926, and a second one, in the vicinity of Big Noise Creek and Rock Creek in the eastern end of the county, has been started, and others in the section east of Astoria have been planned for early improvement.

Work in Clatsop County during the biennium just closed has been handled under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem.

Miles Crossing Pavement Widening

On the Roosevelt Coast Highway, at Mile Post 4.40 south of Astoria; a 40-degree curve flattened to a 28-degree curve and new alignment graded, surfaced and paved with concrete pavement, seven inches thick at its connection with the existing bituminous pavement, and nine inches thick at the outer edge, the extra thickness being obtained in the last three feet of the outer edge.

Contract awarded April 5, 1928, to Rohaut & Gearhart, of Astoria, Oregon. Work commenced April 16, 1928; completed May 10, 1928. Final cost, $2,895.50. Resident Engineer, G. S. Gray.

At the time of the construction of the highway pavement at Miles Crossing, the northwest corner of the intersection, which is practically a right angle corner around which the route of the Roosevelt Highway turns, was occupied by a residence which was moved back to permit adequate sight distance around the 40-degree curve, which was then constructed. In the spring of 1928 the construction of a large modern service station was undertaken on this corner which would have seriously interfered with the sight distance, and improvement in the situation seemed absolutely necessary. Arrangements were made, therefore, whereby the proposed service station was set back so as to permit the curve being flattened to a 28-degree curve and the highway pavement was widened to conform to the new alignment under the contract described above. The pavement was constructed to conform to a standard 20-foot width with standard widening on the curve and longitudinal joints parallel with the inside edge of the pavement spaced 10 feet apart. The area between the old pavement and the outside edge of the standard 20-foot width on the new location also was paved.

[CLATSOP]

The only other special features in connection with this construction were the use of a thicker section, with a projection for a distance of six inches underneath the old pavement at points where the new pavement joined the existing concrete pavement, and a submerged shoulder extending outside the edge of the pavement surface at a depth of seven inches below the surface for a distance of two feet where the section of new pavement was two feet or less in width. This latter feature was used in order to provide a more stable section of pavement by making its actual base width not less than three feet, although the wearing surface of the pavement might be as narrow as one foot. The projection underneath the abutting old pavement was not used in that part of the job where the old pavement was of the bituminous type.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 396.00
Additional right of way purchased		603.00
Contract items as follows:		
Concrete pavement, 631.68 sq. yds. at $2.58	$1,629.73	
Expansion joints, 224.7 lin. ft. at 15c	33.71	
Metal reinforcement, 214.2 lbs. at 5c	10.71	
Screenings, 31.5 cu. yds. at $2.90	91.35	
Adjustment account reduction in quantities	65.76	
Force account items:		
Constructing headers adjacent to black top pavement	69.24	
Total amount earned by contractor		1,900.50
Grand total cost of project, all state funds, 1927-28		$ 2,899.50

Soapstone Creek Bridge Approaches Grade Widening and Resurfacing

On the Roosevelt Coast Highway, at Mile Post 39.81 south of Astoria; 0.28 miles of grade widening and resurfacing. Work done by state forces. Work commenced February 16, 1928; completed April 28, 1928. Final cost $5,852.65, from state funds. Resident Engineer, G. S. Gray.

The bridge over Soapstone Creek on the Hamlet Junction-Tillamook County line section of the Roosevelt Coast Highway was rebuilt during the winter of 1927-1928 at the same general site as the old bridge but upon a location which necessitated the grading of new approaches. This grading work was done by state forces. The macadam surfacing of the new grade was also constructed by state forces, using rock from the Clatsop quarry which was furnished under the maintenance materials contract on the Jack Horner Creek-Mohler section.

Astoria-Svensen Repaving

Federal Aid Project No. 121

On the Columbia River Highway, from Mile Post 92.94, at Sta. 0+00, which station is at the junction of the highway with the road leading to Svensen, west to the east city limits of Astoria, at Mile Post 101.77; 8.40 miles of concrete paving; 20 feet wide, seven inches thick at the center and nine inches thick at the edges, the extra thickness being obtained in the outer three feet of both edges.

Contract No. 791, awarded April 23, 1925, to Simonsen & Hefty, of Portland, Oregon. Work commenced February 18, 1926; completed December 22, 1926. Final cost, $384,579.39. Resident Engineer, A. J. Olsen.

[CLATSOP]

A detailed discussion of this project as relates to plans and methods of construction and order of operations is to be found on pages 234-6 of the report for 1925-26. The work done in the succeeding biennium has been the completion by state forces of the earth shoulder, which was begun, but unfinished, in 1926. No rock shoulders were used, since the pavement is 20 feet in width, but the earth shoulders were constructed to a minimum width of six feet, except in a few cuts where the slopes were high and the width was reduced to four feet. This gives a roadbed throughout this section wide enough so that there is room at all points for a car to park on the shoulder entirely clear of the pavement, a condition which exists on practically no other section of the Columbia River Highway between Astoria and Portland.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 15,345.44
Labor and materials furnished by the state:		
Building up shoulders and widening roadbed		56,239.71
Maintaining road during construction		4,389.58
Watchmen and provisions for control of traffic		12,388.03
Contract items as follows:		
Excavation, 5,893.6 cu. yds. at $1.00	$ 5,893.60	
Removal of old pavement, 17,388.72 sq. yds. at 30c	5,216.62	
Preparation of subgrade, 24,341.50 sq. yds. at 5c	1,217.08	
Sand for subbase, 13,719.23 cu. yds. at $2.25	30,868.27	
Crushed rock for subbase, 1,998.11 cu. yds. at $3.00	5,994.33	
6-inch porous drain tile, 4,955.0 lin. ft. at 30c	1,486.50	
Rock or gravel backfill, 583.0 cu. yds. at $3.00	1,749.00	
Portland cement concrete pavement, 20,569.97 cu. yds. at $10.80	222,155.68	
Expansion joints, 35,176.8 lin. ft. at 10c	3,517.68	
Constructing pavement in two strips, 44,182.7 lin. ft. at 7c	3,092.79	
Tie bars, 33,129.6 lbs. at 8c	2,650.37	
Force account items:		
Constructing earth shoulders to pavement	12,230.78	
Constructing tile drains on line change	45.66	
Placing 1"x6" boards under all drain tile	98.27	
Total amount paid to contractor		296,216.68
Grand total cost of project		$384,579.39

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$195,010.13	$ 78,774.49	$273,784.62
Expended 1927-28 biennium	31,756.18	79,038.59	110,794.77
Total expenditures	$226,766.31	$157,813.08	$384,579.39

Cannon Beach Junction-Hamlet Junction Surfacing

Federal Aid Project No. 115

On the Roosevelt Coast Highway, from Mile Post 23.88 at Sta. 180+00, which station is approximately three miles south of Seaside and approximately at the junction of the highway with the road leading to Cannon Beach, south and east to Mile Post 33.98, at Sta. 723+42.6, which station is at the junction of the highway with the road to Hamlet; 10.23 miles of broken stone surfacing, 14 feet wide on top, feathered to 18 feet wide on the bottom, laid in three courses, one sub-base course of three-inch to three-fourths-inch material, four inches thick; one base course of one and one-half-inch to three-fourths-inch material, three and one-half inches thick; and one course of three-fourths-inch to dust material, two and one-half inches thick; and 2,836.5 cubic yards of maintenance materials.

[CLATSOP]

Contract No. 860, awarded January 19, 1926, to Motor Investment Company, of Portland, Oregon. Work commenced April 20, 1926; completed December 6, 1926. Final cost, $89,426.23. Resident Engineer, G. S. Gray.

This project is described in considerable detail on pages 236-7 of the report for 1925-1926. The work was practically complete at the close of that period and no further comment is necessary regarding it.

Under this contract, 2,836.5 cubic yards of crushed rock were furnished and stock piled on the Hamlet Junction-Tillamook County line section for maintenance of that section.

Further details will be found on page 237 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,128.31
Labor and materials furnished by the state:		
Removing slides and building up fills		6,062.08
Clearing filler pits		630.63
Installing drain tile		325.55
Royalty on filler materials		175.00
Purchase of quarry site		425.00
Sprinkling surfacing materials		716.01
Rolling surfacing materials		296.36
Asphalting bridge decks		583.39
Maintaining completed portions of road		758.63
Building up shoulders subsequent to surfacing operations		2,572.76
Installing right-of-way markers		179.62
Rental of state equipment deducted from contractor's estimate		1,486.73
Credit for maintenance materials used on adjacent section	Cr.	8,273.68
Contract items as follows:		
Sub-base course surfacing, 10,041.5 cu. yds. at $1.91	$19,179.27	
Base surfacing, 14,053.0 cu. yds. at $1.93	27,122.29	
Top surfacing, 8,397.0 cu. yds. at $1.95	16,374.15	
Base maintenance materials, 348.0 cu. yds. at $1.22	424.56	
Top maintenance materials, 3,006.5 cu. yds. at 90c	2,705.85	
Hauling maintenance materials, 12,103.0 yd. mi. at 15c	1,815.45	
1.5 inch maintenance materials, 350.0 cu. yds. at $1.00	350.00	
Additional 1.5 inch maintenance materials, 101.0 cu. yds. at 85c	85.85	
Screenings for maintenance, 2,385.5 cu. yds. at 65c	1,550.58	
Hauling screenings, 20,744.0 yd. mi. at 20c	4,148.80	
Earth filler, 6,476.0 cu. yds. at 35c	2,266.60	
Filler haul, 8,574.5 yd mi. at 20c	1,714.90	
Screenings for filler, 1,262.0 cu. yds. at 60c	757.20	
Hauling screenings filler, 3,401.0 yd. mi. at 20c	680.20	
Riprap, 68.0 cu. yds. at $1.00	68.00	
Stripping filler pits, 102.6 cu. yds. at 22c	22.57	
Adjustment account alterations in details of construction	450.00	
Force account items:		
Clearing and grubbing filler pits	1,180.30	
Total amount earned by contractor	$80,846.57	
Deduction for rental of state equipment	1,486.73	
Total amount paid to contractor		79,359.84
Grand total cost of project		$ 89,426.23

PARTICIPATION IN COST

	State	County	Government	Total
Expended 1925-26 biennium	$71,952.00	$	$ 6,864.86	$78,816.86
Expended 1927-28 biennium	Cr 52,490.53	30,000.00	33,099.90	10,609.37
Total of expenditures	$19,461.47	$30,000.00	$39,964.76	$89,426.23

Approaches to Lewis and Clark River Bridge Paving

On the Roosevelt Coast Highway, at the Lewis and Clark River Bridge, which is at Mile Post 5.30 south of Astoria, 958.8 feet on the west approach and 467.2 feet on the east approach; 0.27 mile of concrete

[CLATSOP]

paving; 20 feet wide, seven inches thick at center and nine inches thick at edges, the extra thickness being obtained in the outer three feet of both edges.

Contract No. 949, awarded March 3, 1927, to John Slotte & Company, of Astoria, Oregon. Work commenced March 11, 1927; completed May 16, 1927. Final cost, $11,929.25. Resident Engineer, A. J. Olsen.

The Lewis and Clark River Bridge approach embankments were constructed by a dredged sand fill completed in 1924 and a macadam surfacing was placed in the winter of 1924. See page 207 of the report for 1923-1924 and pages 236 and 241 of the report for 1925-1926. These embankments proved so stable and compact that very little settlement indeed took place in the following two years and they were then deemed safe for paving and that work was done early in 1927.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 495.30
Watchmen and flagmen for traffic control		1,375.15
Building up shoulders		671.30
Contract items as follows:		
Removal of old pavement, 277.0 sq. yds. at 30c	$ 83.10	
Preparation of subgrade, 3,495.46 sq. yds. at 7c	244.68	
Sand sub-base, 210.0 cu. yds. at $1.95	409.50	
Portland cement concrete pavement, 3,178.59 sq. yds. at $2.28	7,247.19	
Expansion joints, 1,142.6 lin. ft. at 10c	114.26	
Tie bars, 928.0 lbs. at 6c	55.68	
Base rock, 10.5 cu. yds. at $2.25	23.63	
Force account items:		
Constructing earth shoulder to hold sand fill	188.50	
Clearing and removal of old planking	217.96	
Widening and building up shoulders	803.00	
Total amount paid to contractor		9,387.50
Grand total cost of project, all state funds, 1927-28		$ 11,929.25

Cannon Beach Junction-Hamlet Junction Grading

Federal Aid Project No. 115

On the Roosevelt Coast Highway, from Mile Post 23.88, at Sta. 180+00, which station is approximately three miles south of Seaside, and approximately at the junction of the highway with the road leading to Cannon Beach, south and east to Mile Post 33.98, at Sta. 732+42.6, which station is at the junction of the highway with the road leading to Hamlet; 10.23 miles of grading.

Contract No. 769, awarded February 26, 1925, to Greenwood and Dann, of Portland, Oregon. Work commenced March 7, 1925; completed November 7, 1925. Final cost, $183,243.92. Resident Engineer, G. S. Gray.

Although the actual construction work of grading the Cannon Beach Junction-Hamlet Junction section was completed just before the close of the preceding biennium, a final settlement for the work was not reached until spring of 1928, owing to the presentation by the contractor of a number of claims of considerable amount for additional and extra payment on various items of the work. Approval of these claims was refused by the Division Engineer in charge of the work and at the contractors' request the controversy was submitted to a special board

[CLATSOP]

consisting of Division Engineers C. W. Wanzer and J. S. Sawyer, who were selected by the contractor from a list of department engineers submitted by the State Highway Engineer. An ultimate settlement was made upon payment of the amount recommended by this board.

Expenditures on this project during the current biennium have been confined to this final payment on the contract.

Further details will be found on page 240 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 7,542.43
Labor and materials furnished by the state:		
Crushed rock placed on new grade for winter travel		650.00
Channel change		423.37
Right of way stakes, signs and markers		354.39
Contract items as follows:		
Clearing and grubbing, all	$25,000.00	
Extra clearing and grubbing, 4.11 acres at $600.00	2,466.00	
Class "A" excavation, 71,116.4 cu. yds. at 47c	33,424.71	
Class "B" excavation, 19,843.4 cu. yds. at 90c	17,859.06	
Class "C" excavation, 10,134.1 cu. yds. at $1.10	11,147.51	
Class "D" excavation, 21,944.0 cu. yds. at 75c	16,458.00	
Overhaul, 147,637.0 yd. sta. at 5c	7,381.85	
Truck haul, 3,909.4 yd. mi. at 50c	1,954.70	
12-inch concrete pipe, 1,447.0 lin. ft. at $1.50	2,170.50	
18-inch concrete pipe, 878.0 lin. ft. at $3.70	3,248.60	
24-inch concrete pipe, 340.0 lin. ft. at $5.70	1,938.00	
36-inch concrete pipe, 479.0 lin. ft. at $8.00	3,832.00	
6-inch porous drain tile, 2,996.0 lin. ft. at 50c	1,498.00	
Rock or gravel backfill, 281.0 cu. yds. at $3.00	843.00	
Class "A" concrete, 29.17 cu. yds. at $30.00	875.10	
Class "B" concrete, 32.43 cu. yds. at $27.00	875.61	
Class "C" concrete, 115.44 cu. yds. at $25.00	2,886.00	
Metal reinforcement, 2,668.0 lbs. at 8c	213.44	
Lumber and timber, 216.720 M-FBM at $65.00	14,086.80	
Timber piling, 2,374.3 lin. ft. at 90c	2,136.87	
Unused piling, 497.0 lin. ft. at 43c	213.71	
Run-of-bank gravel, 3,833.5 cu. yds. at $1.65	6,325.28	
Adjustment account of alteration in details of construction	16,946.35	
Force account items:		
Hauling and relaying old plank	179.27	
Removing ties and rails from railroad	76.83	
Detour and temporary bridge	119.60	
Opening channel of Necanicum river	116.94	
Total amount paid to contractor		174,273.73
Grand total cost of project		$183,243.92

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$21,828.54	$49,999.99	$94,268.79	$166,097.32
Expended 1927-28 biennium	Cr. 2,853.41	20,000.01	.....	17,146.60
Total of expenditures	$18,975.13	$70,000.00	$94,268.79	$183,243.92

Bradley Park at Clatsop Crest

On the Columbia River Highway, at Clatsop Crest, at Mile Post 80.0.

Continuing the same general plan as heretofore, the comfort station and concession facilities at Bradley Park have been maintaned and operated under lease to Mr. J. J. Lynott. The present lease, given in February, 1926, was originally for a term of three years, but in March, 1928, was extended for one year until February, 1930, at the request of the lessee to justify the expenditure he wished to make in improvements in the concession building. The comfort station building has been repainted inside and necessary minor repairs to buildings and equipment have been kept up.

[CLATSOP]

Rock Creek and Big Noise Creek Culverts

Federal Aid Project No. 135-A

On the Columbia River Highway; two 8 by 8 feet concrete box culverts.

Contract No. 1,021, awarded November 29, 1927, to Lindstrom & Feigenson, of Portland, Oregon. Final cost, $10,152.11. Resident Engineer, Christ Fauerso.

These two culverts will replace wooden trestles now in use. In each case extensive line changes are under way which will eliminate dangerous curves at the existing trestles.

Detailed Statement of Expenditures

Engineering		$ 942.96
Purchase of right of way		100.00
Contract items as follows:		
Excavation, 546.42 cu. yds. at $2.50	$ 1,366.05	
Class "A" concrete, 345.04 cu. yds. at $18.50	6,383.24	
Metal reinforcement, 32,440 lbs. at 4½c	1,459.80	
Total amount earned by contractor	$ 9,209.09	
Deductions:		
Cement adjustment under run	99.94	
Total amount paid to contractor		9,109.15
Grand total cost of project, 1927-28		$ 10,152.11

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended to date	$ 7,453.47	$ 2,698.64	$ 10,152.11
Estimated balances to complete	Cr. 464.45	464.45	----------
Estimated total costs	$ 6,989.02	$ 3,163.09	$ 10,152.11

Bear Creek Bridge

This project was completed during 1923, and is described on page 211 of the 1923-24 report. The only expenditure this biennium was the release to the contractor of the retained percentage on the contract, amounting to $160 from state funds.

Soapstone Creek Bridge

Federal Aid Project No. 115-B

On the Roosevelt Coast Highway, about 11½ miles north of Mohler; one 108-foot skewed concrete arch with two 20-foot concrete approach spans.

Contract No. 1,004, awarded September 27, 1927, to Lindstrom & Feigenson, of Portland, Oregon. Work commenced October 13, 1927; completed March 31, 1928. Final cost, $25,877.37. Resident Engineer, Christ Fauerso.

This structure replaces an old covered wooden bridge. On November 22, when the false work for the main span was about completed, the temporary bridge and all false work were taken out by high water. The contractor immediately started to work on a temporary bridge and had it open to traffic December 6. In spite of the delay caused by high water, the contractor completed the job two months ahead of time.

[CLATSOP]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,349.80
Clearing site for storing concrete materials		52.63
Crushed rock for concrete furnished under contract No. 944		1,107.74
Placing name plates on bridge		5.50
Contract items as follows:		
Excavation, 553.22 cu. yds. at $3.50	$ 1,936.27	
Class "A" concrete, 346.56 cu. yds. at $30.00	10,396.80	
Class "D" concrete, 136.68 cu. yds. at $30.00	4,100.40	
Metal reinforcement, 75,247.0 lbs. at 4½c	3,386.12	
Concrete handrail, 312.0 lin. ft. at $5.00	1,560.00	
Removal of old bridge and maintenance of traffic	1,800.00	
Force account items:		
Removing large twin stump, Sta. 12+28	89.74	
Furnishing 3% Diatonite to Class "A" concrete	128.50	
Rebending steel for end of panels	53.87	
Total amount earned by contractor	$23,451.70	
Deduction for crushed rock furnished	1,090.00	
Total amount paid to contractor		22,361.70
Grand total cost of structure, 1927-28		$ 25,877.37

PARTICIPATION IN COST

State	$12,855.57
Government	13,021.80
Total	$25,877.37

Maintenance

Maintenance work in Clatsop county in the past two years has been confined entirely to the routine operations usual on highways which have been fully constructed, minor betterment work in the construction of a short section of bituminous macadam surfacing between Seaside and Cannon Beach Junction, and the placing of a non-skid surface treatment on those sections of the Columbia River Highway where the most trouble has been experienced by traffic on account of skidding. This latter work is the only feature of maintenance and betterment work in Clatsop County that demands any particular mention. It was done in the summer of 1928 and consists of a modification of the process used near Aurora in 1927. Several methods of applying this non-skid treatment were tried, and the one finally adopted for practically all of the work in 1928 was, in effect, a very light penetration type redress. The oiling material used was Gasco road binder No. 2, a tar by-product manufactured by the Portland Gas and Coke Company, and the rock material was crushed gravel shipped by barge from Portland to various points along the Columbia River convenient to the sections to be treated. A detailed description of the specifications for this work will be found in the general section covering oiling and bituminous macadam maintenance and betterment work.

The sections covered with the non-skid surface in Clatsop County were six in number: The first and largest is in the vicinity of Clatsop Crest, from Mile Post 78.0 to Mile Post 81.3; in the vicinity of Gnat Creek, from Mile Post 82.65, to Mile Post 83.10 at the Big Creek Under-

[CLATSOP]

crossing, from Mile Post 89.25 to Mile Post 89.65; at Knappa, from Mile Post 88.50 to Mile Post 88.95; at Ferris Creek, from Mile Post 92.15 to Mile Post 92.45; and at the John Day River, from Mile Post 97.9 to Mile Post 98.2 over the old bituminous pavement where a gap has been left in the new concrete pavement to allow for the construction of a new bridge.

Maintenance operations in Clatsop County have been under field charge of G. S. Gray, Resident Engineer, with headquarters at Tillamook, Oregon.

Jack Horner Creek-Mohler Maintenance Materials

On the Roosevelt Coast Highway, from Mile Post 38.0, approximately 1.3 miles north of the crossing of Jack Horner Creek, south to Mile Post 51.0 near the town of Mohler; maintenance materials in stock piles.

Contract No. 944, awarded January 28, 1927, to Simonsen & Hefty, of Portland, Oregon. Work commenced March 8, 1927; completed November 20, 1927. Final cost, $25,433.27. Resident Engineer, A. J. Olsen.

This contract provided for furnishing crushed rock for maintenance of the Roosevelt Coast Highway between Jack Horner Creek, in Clatsop County, and Mohler, in Tillamook County, and for future oiling of that section. The contract was arranged in connection with a similar contract on the Seaside-Jack Horner Creek section and was let at the same time.

In addition to the quantity for this project, 420 cubic yards of crushed rock were produced and delivered to the Soapstone Creek Bridge, and 335 cubic yards to the North Fork Nehalem Bridge, for use in the future construction of new bridges at those places.

Material under this contract was produced from the quarry known as the Clatsop quarry, located about one and a half miles north of the Clatsop-Tillamook County line.

Detailed Statement of Expenditures

Engineering		$ 1,157.57
Rental of state equipment deducted from contractor's estimate		261.00
Payment for damage to road from log hauling operations	Cr.	600.00
Processing surfacing materials		239.66
Lease of stock pile sites		75.00
Preparation of stock pile sites		96.00
Credit for materials used on adjacent projects	Cr.	1,803.75
Contract items as follows:		
Crushed rock delivered at Soapstone creek bridge, 420 cu. yds. at $2.50	$ 1,050.00	
Crushed rock delivered to Nehalem River Bridge	753.75	
Grade "A" material in stock pile, 888.21 cu. yds. at $1.42	1,261.26	
Grade "B" material in stock piles, 4,490.85 cu. yds. at $1.42	6,377.01	
Grade "C" material in stock piles, 2,918.84 cu. yds. at $1.42	4,144.75	
Grade "C" material on road, 2,768.5 cu. yds. at $1.30	3,599.05	
Hauling broken stone (truck measure) 7,873.5 yd. mi. at 18c	1,417.23	
Hauling broken stone (pile measure) 29,762.30 yd. mi. at 20c	5,952.46	
Force account items:		
Clearing, grubbing and leveling stock pile sites	1,713.28	
Total amount earned by contractor	$26,268.79	
Deduction for rental of state-owned equipment	261.00	
Total amount paid to contractor		26,007.79
Total cost of project, all state funds, 1927-28		$ 25,433.27

[CLATSOP]

Seaside-Jack Horner Creek Maintenance Materials

On the Roosevelt Coast Highway, from Mile Post 24.0, approximately four miles south of Seaside, south to Mile Post 38.0, approximately 1.3 miles north of the crossing of Jack Horner creek; maintenance material in stock piles.

Contract No. 935, awarded January 27, 1927, to Motor Investment Company of Portland, Oregon. Work commenced March 16, 1927; completed May 17, 1927. Final cost, $30,137.55. Resident Engineer, A. J. Olsen.

For the furnishing of materials for maintenance and future oiling of the Roosevelt Highway in Clatsop County south of Seaside, this contract was undertaken in conjunction with a similar one on the adjoining section to the south. The material secured under this contract was crushed rock from the Hjorteland quarry, about 10 miles south of Seaside, from which the original macadam of the Cannon Beach Junction-Hamlet Junction section was constructed.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 714.67
Labor and materials furnished by the state:		
Preparing stock pile sites		232.89
Hauling and processing surfacing materials		2,020.31
Widening roadbed		38.50
Digging drainage ditches		64.00
Forfeited bidders' bond of Simonsen & Hefty		Cr. 670.50
Contract items as follows:		
Grade "A" materials in trucks, 41.39 cu. yds. at $1.50	$ 62.09	
Grade "A" materials in stock piles, 815.41 cu. yds. at $1.65	1,345.43	
Grade "B" materials in stock piles, 4,910.36 cu. yds. at $1.50	7,365.54	
Grade "C" materials in stock piles, 3,557.47 cu. yds. at $1.30	4,624.71	
Grade "C" materials in bunkers, 45.19 cu. yds. at $1.15	51.97	
Grade "C" materials on road, 2,856.5 cu. yds. at $1.15	3,284.98	
Grade "X" materials, 42.0 cu. yds. at $1.00	42.00	
Extra grade "B" materials, 110.72 cu. yds. at $2.42	267.94	
Extra grade "C" materials, 162.75 cu. yds. at $4.42	393.83	
Hauling materials, truck measure, 13,052.0 yd. mi. at 20c	2,610.40	
Hauling materials, stock pile measure, 28,241.01 yd. mi. at 20c	5,648.20	
Force account items:		
Preparing stock pile sites	2,040.59	
Total amount paid to contractor		27,737.68
Grand total cost of project, all state funds, 1927-28		$ 30,137.55

Hamlet Junction-Tillamook County Line Maintenance Materials

On the Roosevelt Coast Highway, from Mile Post 33.92, at the intersection with the road to Hamlet, south to Mile Post 44.69 at the Clatsop-Tillamook County Line; the furnishing of 2,836.5 cubic yards of maintenance material in stock piles.

Resident Engineer, G. S. Gray.

Before the completion of the surfacing of the Cannon Beach Junction-Hamlet Junction section of the Roosevelt Coast Highway, it became desirable to increase the amount of material to be furnished under that contract in an amount sufficient to meet the need of maintenance material required on the section of the highway immediately south to the Tillamook County line.

This additional work was done under a special agreement with the contractor, and the cost of this additional material will be found in the detailed expenditure statement of the Cannon Beach Junction-Hamlet Junction Surfacing on another page in this report.

[CLATSOP]

Astoria-Seaside Extra Right of Way

Existing right of way of the Roosevelt Coast Highway south of Astoria to Seaside, is, in general, only 40 feet in width. In connection with the improvement made at Miles Crossing, where additional right of way was acquired to permit cutting the sharp corner and to give a standard 40-foot width on that side of the center line throughout the property involved in the corner improved, arrangements were also made with some of the other owners in the section between Miles Crossing and Warrenton by which a similar widening of the right of way through their property will be conveyed to the state in consideration of the construction by the state of a fence along the new right of way line. This work has not been completed at the close of the biennium, but will be finished next year. This sort of cooperation on the part of property owners is highly appreciated in the face of the all too prevalent idea in the minds of many that the state is legitimate prey in the matter of right of way damages.

Big Noise Creek-Rock Creek Survey

One of the points at which a betterment project, involving changes of line and reconstruction of the highway, has been brought about by the condition of bridges necessitating reconstruction or replacement, is the project covering the Big Noise Creek-Rock Creek section on the Columbia River Highway in Clatsop County. In anticipation of the necessity for rebuilding the bridges over these creeks in the near future a survey was undertaken for a relocation which would involve about 0.79 mile of reconstruction of the highway and the replacement of the bridges with concrete culverts.

The original survey was made and plans prepared for the project early in 1927, and some minor revisions were made later in the year prior to the construction of the culverts, which were begun in the fall of 1927. This survey extended from Mile Post 84.45 to Mile Post 85.35, and was made under the supervision of A. J. Olsen, Resident Engineer.

Big Creek Survey

In preparation for a future betterment project involving a change of line in the vicinity of the undercrossing of the Big Creek Logging Company's railroad, near Knappa, on the Columbia River Highway in Clatsop County, a survey was begun in March, 1927, for a study of several alternate lines. No definite determination upon any one of the several possible locations has been made, and in addition to the lines which have been thus far investigated there are others which have suggested themselves and which will be further investigated before any final decision is reached. The territory included in the surveys which have so far been made, extends from the Knappa Crossroads at about Mile Post 88.53 to about Mile Post 90.32, about one-half mile east of the Union High School, a distance of 1.79 miles.

This survey was made under the direction of A. J. Olsen, Resident Engineer.

COLUMBIA COUNTY

As in the previous biennium, state highway work in Columbia County has been confined entirely to matters of maintenance and operation. The original construction of the state highway system in this county was finished with the completion of the Columbia River Highway in 1923, and no new construction or major betterment work has been undertaken.

All work in the county has been handled under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem.

Maintenance

The only item of highway maintenance work in Columbia County in 1927 and 1928 has been that of the non-skid treatment of various sections of the Columbia River Highway in 1928. This work was identical with that done in Clatsop County and the following seven sections have been covered: Near the Multnomah County Line, from Mile Post 19.30 to Mile Post 19.60; at St. Helens, from Mile Post 28.55 to Mile Post 29.05; near Columbia City, from Mile Post 30.25 to Mile Post 30.55; near Deer Island, from Mile Post 35.30 to Mile Post 35.80; at Little Jack Falls, from Mile Post 44.00 to Mile Post 44.60; just east of Rainier, from Mile Post 46.45 to Mile Post 46.95; and on Rainier Hill, from Mile Post 48.50 to Mile Post 50.90.

Maintenance work in Columbia County east of Delena during 1927-1928 has been under the field charge of F. D. Eason, Resident Engineer, with headquarters at McMinnville, Oregon, and west of Delena under G. S. Gray, Resident Engineer, with headquarters at Tillamook, Oregon.

Houlton Extra Right of Way

On the Columbia River Highway at Houlton.

One of the most restricted sections of right of way on any part of the state highway system is that through the former town of Houlton, now a part of St. Helens, on the Columbia River Highway in Columbia County. Negotiations have been carried on with property owners involved looking toward the much-needed widening of this right of way and in one case a settlement has been reached and the highway has been widened. This is a stretch of approximately 750 feet immediately south of Milton Creek, where the right of way has been increased from 40 feet to 70 feet in width.

Fall Creek Survey

In connection with the reconstruction of the bridge over Fall Creek, just west of Clatskanie at Mile Post 65.72 on the Columbia River Highway in Columbia County, a survey was made in March and April of 1928 for a short revision of line to provide better alignment at the immediate site of the bridge and cut off some of the sharp curves west of the bridge. This survey was only approximately one-quarter mile in extent and does not contemplate any radical or extensive change. The Fall Creek Bridge, which was originally a short wooden truss span, has been replaced with a wooden trestle structure since it is anticipated that eventually the Columbia River Highway will be relocated upon a cut-off line which will eliminate the present line across Fall Creek. For the same reason no major changes in the highway in the vicinity of the bridge is contemplated.

Field work on this survey was under the direction of G. S. Gray, Resident Engineer.

COOS COUNTY

All grading and original surfacing work within this county have been completed and at this time there remains to be added only such oiling or light paving as may be required. A bituminous macadam surfacing has been constructed between Coquille and Myrtle Point and contracts have been awarded for the manufacturing of materials which are being used in resurfacing the first six miles east of Myrtle Point and for resurfacing the unit between Coquille and Riverton.

Work in the county has been handled under the supervision of W. E. Chandler, Division Engineer, with headquarters at Grants Pass.

Coquille Fill Grading

On the Coos Bay-Roseburg Highway, at the intersection of Front and Hall streets; 250 lineal feet of grading on Front street and 150 lineal feet on Hall street.

During the biennium, $681.87 was expended on this work, bringing the total construction cost to $6,730.35. During the same period, $2,500 was received in cooperation, leaving the expenditures divided at $4,230.35 from state funds and $2,500 from city of Coquille funds.

Further details will be found on page 255 of the 1925-26 report.

Hauser-Douglas County Line Forest Road Project

This project was completed during the previous biennium and a descriptive article will be found on page 256 of the 1925-26 biennial report.

During the biennium now closing the state has received a refund of $1,713.61 for prior excess cooperation paid.

The completed project now represents a total expenditure of $163,116.55, of which Coos County has paid $83,000 and the federal government $80,116.55.

North Slough Bridge

On the Roosevelt Coast Highway, near Hauser; a 40-foot I beam bascule span and 381 lineal feet of pile trestle.

Contract No. 940, awarded January 27, 1927, to J. W. and J. R. Hillstrom, of Marshfield, Oregon. Work commenced March 1, 1927; completed April 30, 1927. Final cost, $9,933.74. Resident Engineer, V. E. Perkins.

This structure replaces a timber bridge built in 1916. Many of the Port Orford cedar piling driven when the old bridge was built were found to be in perfect condition and were used in new structure.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 638.32
Credit for sale of old lumber		Cr. 15.00
Contract items as follows:		
Piling, 1,100.0 lin. ft. at 60c	$ 660.00	
Lumber, 112,858 M-FBM at $52.00	5,868.62	
Structural steel, 25,580.0 lbs. at 8c	2,046.40	
Removal of old bridge and maintenance of traffic	700.00	
Pile cut-off, 236.0 lin. ft. at 15c	35.40	
Total amount paid to contractor		9,310.42
Grand total cost of structure, all state funds, 1927-28		$ 9,933.74

[COOS]

Roosevelt Ferry

On the Roosevelt Coast Highway, from Glasgow to North Bend.

This ferry was taken over from Coos County and is now being operated as a state ferry, running from North Bend to Glasgow across the steamer channel. Repairs made have included the installation of a new boiler and minor repairs to hull and superstructure.

The ferry has a capacity of 19 cars and operates from 7 o'clock a. m. to 11 o'clock p. m. The time for a round trip is 20 minutes, covering a distance of 4,300 feet, one way. It is an important link in the highway and during the summer months carries capacity loads of people finding sport and relaxation in the beautiful lake district about 10 miles north of Glasgow. The average daily number of cars carried is 393 for a period of six months, with a maximum daily run on July 3 of 1,204 cars.

Expenditures have amounted to $12,974.23 from state funds.

Riverton-Coquille-Hoffman Bridge Resurfacing

On the Roosevelt Coast Highway, from Riverton, six miles south and west of Coquille, to the Coquille River Bridge, at Coquille, and on the Coos Bay-Roseburg Highway, from Coquille to a point 6.0 miles east of Myrtle Point. The portions within the towns of Coquille and Myrtle Point which are paved were not included in this contract. Twelve miles of resurfacing and the furnishing of 21 miles of maintenance materials. Gravel on the resurfacing sections spread to a uniform width of 18 feet.

Contract No. 1,031, awarded March 27, 1928, to McGeorge Gravel Co., of Marshfield, Oregon. Work commenced April 16, 1928. Estimated cost, $87,000 from state funds. Expenditures to date, $39,712.69. Resident Engineers, Paul Van Scoy and W. M. Strohmeyer.

Leases on all stock-pile sites were obtained by the state and the preparation of same was done by state forces. All scarifying and processing as to preparation of sub-grade on the resurfacing sections was done by state forces also. Work progressing satisfactorily, being 60 per cent complete with an estimated date of completion of February 15, 1929.

Lakeside Overcrossing Survey

This survey was made to eliminate a grade crossing on the Roosevelt Coast Highway at a point approximately two miles south of Lakeside. Work was started by Paul Van Scoy, Resident Engineer, on March 25, 1928, and was completed on April 6. The total length of the new location was 1,000 feet.

Larson-Haines Slough Survey

This survey was made in order to eliminate two long trestles now existing over Larson and Haines sloughs and contemplated the construction of a roadbed which could serve as a dike in order to keep the tide waters from overflowing the adjacent low marsh lands. A cooperative project for the construction of this new roadbed has been under consideration, but no definite decision has been made.

The survey was made under the direction of Paul Van Scoy, and covered a total length of 4,700 feet. Work on the survey was started on November 8, 1927, and was completed on the 26th of the same month.

CROOK COUNTY

During the past biennium there have been no major improvements in the highway system in this county. The main activities in the county have been confined to some minor betterment work and general maintenance of the existing highways.

A tract of land facing the Ochoco Highway and adjoining the city limits of Prineville has been purchased and a building has been erected for maintenance headquarters.

The minor betterment work consisted of widening narrow sharp cuts, flattening the curves and using the material to widen narrow fills at dangerous places.

The work in this county is under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend.

Maintenance

There is approximately 28.4 miles of the Prineville-Lakeview Highway which has been graded but never surfaced. This section runs from Prineville up the Crooked River to Bear Creek, thence up Bear Creek. The roadway for a considerable portion of the section is made of material that is of a sandy nature or disintegrated rock, which stands up well under the limited travel which this highway carries, and by hauling and distributing this material or gravel on the weak sections a fair roadway is maintained throughout the year.

The maintenance of the 29 miles of the Ochoco Highway east of Prineville consisted of the usual blading, cleaning ditches, removing slides and snow. West of Prineville, towards the Deschutes County line, for 16 miles the roadbed is oiled and the maintenance consists of the usual reoiling of the shoulders and patching the surface.

This section had been oiled originally with light oil in 1926. It was necessary to reoil the greater portion in 1928, which required approximately 100 yards of new gravel to the mile. This material was trapped, hauled out and stock-piled by state forces.

W. S. Hodge is Resident Maintenance Engineer with headquarters at Redmond.

Equipment Shed at Prineville

On the highway at Prineville; one 28 by 48-foot equipment shed of timber construction.

Contract No. 1,012, awarded October 25, 1927, to John J. Cunningham, of Bend, Oregon. Work commenced November 1, 1927; completed February 1, 1928. Final cost, $3,104.31. Resident Engineer, W. S. Hodge.

This equipment shed houses the equipment of the patrol maintenance crew at Prineville and provides a shop wherein repairs are made to equipment, and supplies are stored.

CURRY COUNTY

Since the publication of the last biennial report all grading and surfacing of the Roosevelt Coast Highway through Curry County has been completed, with the exception of the approaches which will be required when the bridge is built across the Rogue River between Gold Beach and Wedderburn. This result has been achieved and the work has been carried on in accordance with the policy announced three years ago by the State Highway Commission of completing the Roosevelt Coast Highway from Coquille to the California line with as little delay as possible.

Work in the county during the biennium has been handled under the supervision of W. E. Chandler, Division Engineer, with headquarters at Grants Pass.

North Unit Myers Creek-Chetco River Surfacing

On the Roosevelt Coast Highway, from Myers Creek Bridge, about 11 miles south of Gold Beach, to Sta. 238+50, which station is about 19 miles south of Gold Beach; 8.18 miles of surfacing and the furnishing of maintenance materials in stock piles.

Contract No. 968, awarded April 19, 1927, to J. W. and J. R. Hillstrom, of Marshfield, Oregon. Work commenced June 3, 1927; completed November 19, 1927. Final cost, $51,018.46. Resident Engineer, B. O. Johnson.

Surfacing materials were taken from the gravel bars of Pistol River. These were the best materials available and have provided a very satisfactory surfacing.

Detailed Statement of Expenditures

Engineering		$ 2,410.99
Labor and material furnished by the state:		
Sprinkling surfacing materials		1,299.64
Royalty paid for gravel used		1,140.50
Lumber for flumes along sand slopes		47.57
Signs for control of traffic		17.10
Contract items as follows:		
Bridge approach embankment, 300.0 cu. yds. at 75c	$ 225.00	
Sub-base course surfacing, 9,332.5 cu. yds. at $1.70	15,865.25	
Base course surfacing, 5,660.0 cu. yds. at $1.70	9,622.00	
Top course surfacing, 6,043.5 cu. yds. at $1.70	10,273.95	
Earth cushion, 3,849.0 cu. yds. at 40c	1,539.60	
Earth cushion haul, 4,363.0 yd. mi. at 20c	872.60	
Earth filler, 2,371.0 cu. yds. at 35c	829.85	
Filler haul, 3,255.25 yd. mi. at 20c	651.05	
Stripping filler pits, 120.4 cu. yds. at 25c	30.10	
Base course maintenance materials, 1,944.0 cu. yds. at $1.70	3,304.80	
Top course maintenance materials, 1,075.9 cu. yds. at $1.70	1,829.03	
Maintenance material extra haul, 120.8 yd mi. at 22c	26.58	
Force account items:		
Constructing cattle guard, Sta. 727+50	40.59	
Salvaging gravel from hauling road, Sta. 721	213.48	
Constructing cedar box outlet drains thru cuts	349.35	
Clearing and leveling stock pile site	39.42	
One half cost of temporary bridge over Pistol River	390.01	
Total amount paid to contractor		46,102.66
Grand total cost of project, all state funds, 1927-28		$ 51,018.46

[CURRY]

South Unit Myers Creek-Chetco River Surfacing

On the Roosevelt Coast Highway, from Sta. 238+20, which station is about 19 miles south of Gold Beach, to Sta. 265+62, which station is about five miles north of the California state line; 20 miles of surfacing and furnishing maintenance materials in stock piles.

Contract No. 969, awarded April 19, 1927, to Wren & Greenough, of Portland, Oregon. Work commenced May 29, 1927; completed November 1, 1927. Final cost, $167,103.94. Resident Engineer, B. O. Johnson.

This contract was completed eight months ahead of the contract time of completion and stands out as one of the fastest jobs in the state. A total of 59,897 cubic yards of surfacing and maintenance materials was crushed and placed in five months of actual work. One complete move of the plant was made and crushing operations were again under way on the eighth day.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,188.17
Labor and material furnished by the state:		
Lumber used by contractor from state storage pile		50.00
Concrete pipe placed by force account		121.70
Royalties paid for gravel used		646.54
Sprinkling surfacing materials		1,995.60
Prospecting for surfacing materials		122.98
Signs for traffic control		9.00
Contract items as follows:		
Sub-base course surfacing, 25,876.5 cu. yds. at $2.50	$ 64,691.25	
Base course surfacing, 14,030.5 cu. yds. at $2.50	35,076.25	
Top course surfacing, 12,023.0 cu yds. at $2.60	31,259.80	
Base course maintenance materials, 4,367.9 cu. yds. at $2.45	10,701.36	
Top course maintenance materials, 3,592.6 cu. yds. at $2.50	8,981.50	
Earth filler, 8,033.5 cu. yds. at 30c	2,410.05	
Filler haul, 15,235.5 yd. mi. at 20c	3,047.10	
Stripping filler pits, 494.4 cu. yds. at 25c	123.60	
Extra haul on maintenance materials, 398.0 yd. mi. at 22c	87.56	
Force account items:		
Placing 6-inch broken rock in soft spots	83.04	
Clearing sites for maintenance stock piles	144.80	
Removing large stones thru town of Brookings	72.35	
Removing oversize rock from filler	453.84	
Clearing filler pits	175.57	
Constructing tile drains	737.07	
Removing slides	1,896.32	
Moving water tanks used in sprinkling operations	78.49	
Total amount earned by contractor	$160,019.95	
Deduction for lumber furnished by the state	50.00	
Total amount paid to the contractor		159,969.95
Grand total cost of project, all state funds, 1927-28		$167,103.94

Euchre Creek-Wedderburn Forest Road Surfacing

This project covers the surfacing of an 11-mile section of the Roosevelt Coast Highway between Euchre Creek and Wedderburn which previously had been graded by the State. A contract for the work was awarded by the Bureau of Public Roads to Tower & Hakanson, who began operations in the fall of 1926 and completed them in the fall of 1927.

The completed surfacing represents a total expenditure of $67,937.33, which has been paid entirely from Federal Government funds.

Further details will be found on page 262 of the 1925-26 report.

[CURRY]

North Unit Euchre Creek-Rogue River Grading

Federal Aid Project No. 124

On the Roosevelt Coast Highway, from Sta. 1046+00, at the Euchre Creek crossing, south to Sta. 1416+00, which station is near the crossing of Edson Creek; 7.01 miles of grading.

Contract No. 850, awarded September 29, 1925, to Hagquist & Bjorkquist, of Marshfield, Oregon. Work commenced October 15, 1925; completed October 31, 1926. Final cost, $80,853.86. Resident Engineer, Jas. G. Toole.

Further details will be found on page 267-8 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 5,266.02
Grass seed furnished by the state		67.00
Contract items as follows:		
Clearing and grubbing, all	$10,000.00	
Excavation, single classification, 126,766.9 cu. yds. at 39c	49,439.09	
Overhaul, 75,640.0 yd. sta. at 4c	3,025.60	
12-inch concrete pipe, 1,687.0 lin. ft. at $1.50	2,530.50	
18-inch concrete pipe, 699.0 lin. ft. at $2.70	1,887.30	
24-inch concrete pipe, 646.0 lin. ft. at $4.00	2,584.00	
6-inch porous drain tile, 226.0 lin. ft. at 50c	113.00	
Broken stone for backfill, 102.0 cu. yds. at $3.00	306.00	
Class "A" concrete, 69.32 cu. yds. at $17.00	1,178.44	
Metal reinforcement, 7,795.0 lbs. at 8c	623.60	
Dry rubble, 70.16 cu. yds. at $5.00	350.80	
Riprap, 13.63 cu. yds. at $4.00	54.52	
Timber piling, 747.0 lin. ft. at $1.00	747.00	
Lumber and timber, 18.320 M-FBM at $60.00	1,099.20	
Extra clearing and grubbing, 0.6 acres at $350.00	210.00	
Earth cushion, 1,112.8 cu. yds. at 65c	723.32	
Force account items:		
Preparation of slopes for and sowing of grass seed	119.29	
Blading subgrade subsequent to completion	187.88	
Building up fills and constructing wooden gutters	321.29	
Replacing water pipe at Sta. 1057	20.01	
Total amount paid to contractor		75,520.84
Grand total cost of project		$ 80,853.86

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$35,729.57	$39,286.67	$ 75,016.24
Expended 1927-28 biennium	Cr. 5,682.51	11,520.13	5,837.62
Total of expenditures	$30,047.06	$50,806.80	$ 80,853.86

Euchre Creek-Rogue River Maintenance Materials

On the Roosevelt Coast Highway, from the gravel bar in Rogue River, approximately three and one-half miles above Wedderburn.

Agreement made September 15, 1927, with Tower and Hakanson, of Gold Beach, Oregon. Work commenced September 15, 1927; completed November 30, 1927. Final cost, $1,982.33. Resident Engineer, Paul Van Scoy.

An agreement was made with Tower and Hakanson, the surfacing contractors on the Euchre Creek-Rogue River section under the Bureau of Public Roads, to furnish 500 cubic yards of one-eighth inch to three-fourth inch material and 500 cubic yards of one-eighth inch to one and one-eighth inches material; the material to be placed in stock piles for future maintenance.

[CURRY]

South Unit Euchre Creek-Rogue River Grading

Federal Aid Project No. 124

On the Roosevelt Coast Highway, from Sta. 1416+00, which station is near Edson Creek crossing, south to Sta. 1625+00, which station is in the town of Wedderburn; 3.98 miles of grading.

Contract No. 851, awarded September 29, 1925, to Schell & Rhodes, of Oakland, Oregon. Work commenced November 3, 1925; completed September 4, 1926. Final cost, $130,436.97. Resident Engineer, Jas. G. Toole.

Further details will be found on page 268-9 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 5,591.24
Grass seed furnished by the state		41.75
Reconstructing private sewer in the town of Wedderburn		107.09
Contract items as follows:		
Clearing and grubbing, all	$ 7,000.00	
Common excavation, 50,785.2 cu. yds. at 40c	20,314.08	
Intermediate excavation, 37,637.1 cu. yds. at 65c	24,464.12	
Solid rock excavation, 64,067.3 cu. yds. at 80c	51,253.84	
Overhaul, 66,270.0 yd. sta. at 7c	4,638.90	
12-inch concrete pipe, 1,008.0 lin. ft. at $1.70	1,713.60	
18-inch concrete pipe, 933.0 lin. ft. at $3.30	3,078.90	
24-inch concrete pipe, 666.0 lin. ft. at $5.00	3,330.00	
6-inch porous drain tile, 860.0 lin. ft. at 50c	430.00	
Broken stone for backfill, 162.0 cu. yds. at $2.75	445.50	
Class "A" concrete, 5.35 cu. yds. at $30.00	160.50	
Dry rubble, 201.99 cu. yds. at $8.00	1,615.92	
Riprap, 182.62 cu. yds. at $4.00	730.48	
Lumber and timber, 41.019 M-FBM at $90.00	3,691.71	
Timber piling, 822.0 lin. ft. at $1.00	822.00	
Extra clearing and grubbing, 4.29 acres at $200.00	858.00	
Force account items:		
Planting willows on slopes	74.22	
Relaying 2-inch water pipe	31.16	
Prospecting for quarry site	43.96	
Total amounts paid to contractor		124,696.89
Grand total cost of project		$130,436.97

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$67,912.70	$58,930.00	$126,842.70
Expended 1927-28 biennium	Cr. 14,393.45	17,987.72	3,594.27
Total of expenditures	$53,519.25	$76,917.72	$130,436.97

Slab and Retaining Wall at Buffington Cannery

On the Roosevelt Coast Highway, at Gold Beach. Final cost, $2,917.19.

The right of way for the section immediately north of Gold Beach crosses land necessary for the operation of the salmon cannery of the Gold Beach Packing Company. In order to avoid expensive condemnation proceedings, the state agreed to build a slab and retaining wall, allowing the packing company the use of the land for storage purposes and carrying the roadway on the slab above this storage space. This work was done by state forces under the direction of A. G. Skelton.

[CURRY]

Myers Creek-Burnt Hill Grading

Federal Aid Project No. 113-A

On the Roosevelt Coast Highway, from Myers Creek, about 11 miles south of Gold Beach, to Sta. 846+35, which station is about 16 miles south of Gold Beach; 5.4 miles of grading 20-foot roadbed.

Contract No. 771, awarded February 26, 1925, to S. S. Schell, of Oakland, Oregon. Work commenced April 1, 1925; completed June 12, 1926. Final cost, $168,524.52. Resident Engineer, B. O. Johnson.

Further details will be found on page 271 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 6,896.44
Grass seed for sowing on slopes by state forces		50.40
Temporary surfacing through winter months		3,214.80
Contract items as follows:		
Clearing and grubbing, all	$ 5,000.00	
Extra clearing and grubbing, 4.87 acres at $100.00	487.00	
Excavation, unit 2, 51,132.7 cu. yds. at 75c	38,349.53	
Excavation, unit 3, 71,629.9 cu. yds at 55c	39,396.45	
Excavation, unit 4, 68,901.3 cu. yds. at 40c	27,560.52	
Overhaul, 148,039.0 yd. sta. at 7c	10,362.73	
12-inch concrete pipe, 33.0 lin. ft. at $2.00	66.00	
18-inch concrete pipe, 1,317.0 lin. ft. at $3.60	4,741.20	
24-inch concrete pipe, 1,125.0 lin. ft. at $5.40	6,075.00	
18-inch x 18-inch cedar culverts, 717.4 lin. ft. at $3.60	2,582.64	
2-ft. x 2-ft. cedar culvert, 280.0 lin. ft. at $5.00	1,400.00	
6-inch porous drain tile, 1,379.0 lin. ft. at 50c	689.50	
Rock or gravel backfill for drains, 219.4 cu yds. at $3.00	658.20	
Class "A" concrete, 247.9 cu. yds. at $30.00	7,437.00	
Metal reinforcement, 30,921.2 lbs. at 7c	2,164.48	
Trestle substructure, 5.943 M-FBM at $90.00	534.87	
Trestle superstructure, 19.0 lin. ft. at $20.00	380.00	
Dry rubble, 63.6 cu. yds. at $8.00	508.80	
Riprap, 1,045.5 cu. yds. at $4.00	4,182.00	
Unused cedar lumber, 420.00 M-FBM at $4.00	1,680.00	
Force account items:		
Removing gravel from repair sections	254.81	
Sowing grass seed on slopes	18.56	
Felling dangerous trees and burning drift near bridge	59.63	
Reconstructing roadbed between Sta. 581 and 614 on account of slides and washouts	3,773.96	
Total amount paid to contractor		158,362.88
Grand total cost of project		$168,524.52

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$90,666.55	$ 660.50	$74,503.16	$165,830.21
Expended 1927-28 biennium	Cr. 14,216.65	.....	16,910.96	2,694.31
Total of expenditures	$76,449.90	$ 660.50	$91,414.12	$168,524.52

Rogue River Approaches Survey

The survey work done under this approach covered the location of new approaches for the ferry operating across the Rogue River at Gold Beach. The survey was made by B. O. Johnson, Resident Engineer, at various times between January 10 and April 8, 1927. The gross length between termini was 0.95 mile. The net length of the location was 0.61 mile.

[CURRY]

Unit No. 1 Burnt Hill-Chetco River Grading

Federal Aid Project No. 119

On the Roosevelt Coast Highway, from Sta. 402+68.5, which station is about 16 miles south of Gold Beach, to Sta. 98+00, which station is about 22 miles south of Gold Beach; 5.8 miles of grading.

Contract No. 833, awarded July 28, 1925, to Bauers & Bauers, of Dayton, Washington. Work commenced September 15, 1925; completed November 13, 1926. Final cost, $280,871.40. Resident Engineer, B. O. Johnson.

Further details will be found on page 269 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 14,650.16
Constructing approach roads		208.45
Hauling pipe testing machine to and from the job		90.00
Constructing drains at Sta. 113		14.48
Grass seed for seeding slopes		153.16
Credit for concrete pipe transfer to Unit No. 2		Cr. 65.28
Contract items as follows:		
Clearing and grubbing, all	$ 12,678.00	
Extra clearing and grubbing, 8.58 acres at $300.00	2,574.00	
Excavation, single classification, 277,159.8 cu. yds. at 67c	185,697.07	
Overhaul, 118,033.0 yd. Sta. at 5c	5,901.65	
12-inch concrete pipe, 1,677.0 lin. ft. at $2.20	3,689.40	
18-inch concrete pipe, 3,732.0 lin. ft. at $4.55	16,980.60	
24-inch concrete pipe, 1,860.0 lin. ft. at $6.25	11,625.00	
6-inch porous drain tile, 1,351.0 lin. ft. at $1.00	1,351.00	
Class "A" concrete, 302.88 cu. yds. at $40.00	12,115.20	
Metal reinforcement, 33,158.6 lbs. at 8c	2,652.69	
Dry rubble, 375.0 cu. yds. at $12.00	4,500.00	
Rock water tunnel, 22.5 lin. ft. at $10.00	225.00	
Force account items:		
Constructing blind stone drains and tile backfill	975.30	
Extra clearing and removing dangerous trees	2,802.97	
Rock backfill on soft sub-grade	174.41	
Constructing wood flumes at culvert outlets	311.92	
Removing slide at Sta. 253	365.32	
Cost of unused material purchased by contractor	1,200.90	
Total amount paid to contractor		265,820.43
Grand total cost of project		$280,871.40

Participation in Cost

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$205,870.57	$	$ 43,158.95	$249,029.52
Expended 1927-28 biennium	Cr. 37,810.68	6,000.00	63,652.56	31,841.88
Total of expenditures	$168,059.89	$ 6,000.00	$106,811.51	$280,871.40

Unit No. 2 Burnt Hill-Chetco River Grading

Federal Aid Project No. 119

On the Roosevelt Coast Highway, from Sta. 98+00, which station is about 22 miles south of Gold Beach, south through Sta. 0+00, to Sta. 80+00; 3.4 miles of grading.

Contract No. 834, awarded July 28, 1925, to Englehart Paving & Construction Company, of Eureka, California. Work commenced August 28, 1925; completed November 13, 1926. Final cost, $110,697.07. Resident Engineer, H. W. Libby.

[CURRY]

This job was completed before contract time limit. Considering that the work was fully 50 per cent blue clay, the progress was very good.

Further details will be found on page 270 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 6,112.11
Grass seed for seeding slopes		51.35
Contract items as follows:		
Clearing and grubbing, all	$ 4,000.00	
Extra clearing and grubbing, 2.02 acres at $300.00	606.00	
Excavation, single classification, 108,238.8 cu. yds. at 75c	81,179.10	
Overhaul, 27,129.4 yd. sta. at 4c	1,085.18	
12-inch concrete pipe, 1,098.0 lin. ft. at $3.00	3,294.00	
18-inch concrete pipe, 1,737.0 lin. ft. at $3.50	6,079.50	
24-inch concrete pipe, 600.0 lin. ft. at $4.50	2,700.00	
30-inch concrete pipe, 324.0 lin. ft. at $5.50	1,782.00	
6-inch porous drain tile, 1,035.0 lin. ft. at 35c	362.25	
Rock backfill, 77.0 cu. yds. at $1.75	134.75	
Dry rubble, 128.84 cu. yds. at $8.00	1,030.72	
Class "A" concrete, 40.6 cu. yds. at $30.00	1,218.00	
Metal reinforcement, 4,966.0 lbs. at 8c	397.28	
Force account items:		
Placing rock on new grade where it coincides with old road	293.43	
Unused reinforcing steel purchased of contractor	138.00	
Unused drain tile and burlap purchased of contractor	233.40	
Total amount paid to contractor		104,533.61
Grand total cost of project		$110,697.07

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$72,833.30	$25,895.37	$98,728.67
Expended 1927-28 biennium	Cr. 23,198.06	35,166.46	11,968.40
Total of expenditures	$49,635.24	$61,061.83	$110,697.07

Bagnalls Ferry

On detour for Roosevelt Coast Highway, from Wedderburn to Gold Beach. Final cost, $386.96.

After the abandoning of the ferry at Bagnalls by the county, the state took over the boat and purchased the cable from the operator. The ferry is used for emergency operation in case the lower ferry is laid up for repairs.

Unit No. 3 Burnt Hill-Chetco River Grading

Federal Aid Project No. 119

On the Roosevelt Coast Highway, from Sta. 80+00, which station is about 26 miles south of Gold Beach, south to Sta. 381+90; 5.7 miles of grading.

Contract No. 835, awarded July 28, 1925, to J. W. Sweeney Construction Company, of Portland, Oregon. Work commenced August 28, 1925; completed August 29, 1927. Estimated cost, $252,000. Resident Engineers, H. W. Libby, C. H. Armstrong and B. O. Johnson.

Due to slow progress by the contractor, this work was not completed until August 29, 1927, eight months late. The cause of this delay can be laid solely to obsolete methods. Teams and hand labor exclusively were used. No shovel work was done.

Further details will be found on page 270 of the 1925-26 report.

[CURRY]

Detailed Statement of Expenditures

Engineering		$ 13,834.54
Labor and materials furnished by state:		
Grass seed for seeding slopes		60.35
Moving house endangered by slide		150.00
Credit for steel transferred to Redwood Highway projects		Cr. 403.25
Concrete pipe purchased for contractor		204.48
Contract items as follows:		
Clearing and grubbing 60-ft. right of way	$ 16,000.00	
Extra clearing and grubbing, 9.46 acres at $400.00	3,784.00	
Excavation, single classification, 226,245.7 cu. yds. at 67c	151,584.62	
Overhaul, 121,734.9 yd. sta. at 6c	7,304.09	
12-inch concrete pipe, 1,311.0 lin. ft. at $2.00	2,622.00	
18-inch concrete pipe, 2,337.0 lin. ft. at $4.00	9,348.00	
24-inch concrete pipe, 564.0 lin. ft. at $6.00	3,384.00	
30-inch concrete pipe, 1,524 lin. ft. at $10.00	15,240.00	
Class "A" concrete, 361.81 cu. yds. at $32.00	11,577.92	
Rubble masonry, 146.82 cu. yds. at $16.00	2,349.12	
Dry rubble masonry, 101.12 cu. yds. at $8.00	808.96	
Metal reinforcement, 40,990.0 lbs. at 10c	4,099.00	
Unused metal reinforcement, 27,549.0 lbs. at 4c	1,101.96	
Crushed rock on hand, 56.0 cu. yds. at $2.07	115.92	
Force account items:		
Bracing 30-inch culvert pipe under high fills	164.90	
Blading roadbed and removing slides, Sta. 78 to 120	135.74	
Clearing windfalls and cutting dangerous trees	503.09	
Placing rock backfill in wet cut Sta. 353-354	90.54	
Resloping cuts due to slides	4,112.05	
Repairing broken pipe culverts account of fill settlement	631.57	
Refinish sections of roadbed damaged by slides, erosion and settlement during winter 1926-27	1,336.01	
Extra clearing on upper side of fill Sta. 200	21.08	
Removing slide at culvert outlet Sta. 365	180.65	
Extra cement used in class "A" concrete	211.19	
Extra expense involved in extension of culverts	61.26	
Construction of blind stone drain at Sta. 298	23.87	
Adjustment of extra expense due to alterations in details of construction	712.60	
Total amount earned by contractor	$237,504.14	
Deductions:		
Concrete pipe furnished by state	165.60	
Final estimate in process of payment	6,043.58	
Total amount paid to contractor		231,294.96
Grand total expended on project		$245,141.08

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$149,223.07	$ 43,158.95	$192,382.02
Expended 1927-28 biennium	Cr. 7,905.77	60,664.83	52,759.06
Total of expenditures	$141,317.30	$103,823.78	$245,141.08
Estimated cost to complete	6,858.92		6,858.92
Estimated total costs	$148,176.22	$103,823.78	$252,000.00

Unit No. 4 Burnt Hill-Chetco River Grading

Federal Aid Project No. 119

On the Roosevelt Coast Highway, from Sta. 381+90, about 32 miles south of Gold Beach, south through Sta. 804+19.3 equals 279+97.5 to 265+62, which station is about five miles north of the California state line; 8.3 miles of grading.

Contract No. 836, awarded July 28, 1925, to Bauers & Bauers, of Dayton, Washington. Work commenced August 27, 1925; completed December 31, 1926. Final cost, $305,683.50. Resident Engineer, C. H. Armstrong.

[CURRY]

This work was completed before expiration of time allowed by contract. Two gas shovels were used on this section.

Further details will be found on page 270 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 18,646.59
Labor and materials furnished by the state:		
Temporary surfacing for winter travel		1,973.27
Strengthening lumber company's trestle at Sta. 789		244.46
Signs for control of traffic		24.00
Constructing approach roads		100.00
Cleaning ditches and culverts and road repair		143.68
Grass seed for seeding slopes		119.46
Reinforcing steel and concrete pipe purchased of contractor		677.08
Contract items as follows:		
Clearing and grubbing, all	$ 18,143.00	
Extra clearing and grubbing, 12.68 acres at $300.00	3,804.00	
Excavation, single classification, 280,363.6 cu. yds. at 67c	187,843.61	
Overhaul, 191,541.0 yd. sta. at 5c	9,577.05	
12-inch concrete pipe, 1,911.0 lin. ft. at $2.20	4,204.20	
18-inch concrete pipe, 2,397.0 lin. ft. at $4.55	10,906.35	
24-inch concrete pipe, 612.0 lin. ft. at $6.30	3,855.60	
30-inch concrete pipe, 915.0 lin. ft. at $8.55	7,823.25	
Class "A" concrete, 624.8 cu. yds. at $40.00	24,992.00	
Metal reinforcement, 68,494.0 lbs. at 8c	5,479.52	
Dry rubble, 335.82 cu. yds. at $12.00	4,029.84	
Riprap, 169.28 cu. yds at $3.50	592.48	
6-inch porous drain tile, 247.5 lin. ft. at $1.00	247.50	
Force account items:		
Falling and clearing away dangerous trees	170.07	
Bracing inside of culvert pipe under deep fills	732.83	
Constructing rock drains	712.74	
Building north approach to Chetco River bridge	314.48	
Salvaging and replacing old surfacing material	326.44	
Total amount paid to the contractor		283,754.96
Grand total cost of project		$305,683.50

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$208,417.74	$ 60,422.53	$268,840.27
Expended 1927-28 biennium	Cr. 51,560.77	88,404.00	36,843.23
Total of expenditures	$156,856.97	$148,826.53	$305,683.50

Pistol River-Chetco River Slide Removals

On the Roosevelt Coast Highway, from the south end of the Pistol River bridge to Sta. 265+62, which station is about five miles north of the California state line. The over-all length of contract was 25.3 miles, but it did not include the section between Sta. 80+00 and Sta. 381+90, which portion is 5.7 miles in length; 19.6 miles of slide removal, building up settlements, additional drainage, constructing rubble masonry walls and riprap and miscellaneous work.

Contract No. 956, awarded March 4, 1927, to Washburn & Hall, of Portland, Oregon. Work commenced June 3, 1927; completed November 19, 1927. Final cost, $70,346.02. Resident Engineer, B. O. Johnson.

This was the first year after a heavy grading job and this in the coast country means a large amount of slides. Due to the quantity, a contract was let for their removal.

[CURRY]

Detailed Statement of Expenditures

Engineering		$ 7,016.62
Culvert pipe for extending culverts		45.46
Contract items as follows:		
Excavation unit "A," 34,543.5 cu. yds. at 60c	$20,726.10	
Excavation unit "B," 14,939.0 cu. yds. at 70c	10,457.30	
Excavation unit "D," 21,854.5 cu. yds. at 60c	13,112.70	
Special solid rock borrow, 5,529.8 cu. yds. at 70c	3,870.86	
Drainage excavation, 2,215.8 cu. yds. at 70c	1,551.06	
Overhaul, 70,446.5 yd. sta. at 5c	3,522.33	
Rock backfill for drains, 805.9 cu. yds. at $2.00	1,611.80	
Rubble masonry, 34.4 cu. yds. at $12.00	412.80	
Riprap, 100.37 cu. yds. at $3.00	301.11	
Class "A" concrete, 4.2 cu. yds at $40.00	168.00	
6-inch drain tile, 2,049.0 lin. ft. at 15c	307.35	
Riprap rock haul, 600 yd. half mi. at 15c	90.00	
Special truck haul, 802.3 yd. mi. at 50c	401.15	
Force account items:		
Clearing on slides and removing dangerous trees	4,740.90	
Hauling and installing concrete pipe	81.63	
Constructing concrete inlet for culvert, Sta. 373	83.92	
Installing cedar box blind drains	214.49	
Resloping cuts after second slides removed	182.02	
Lengthening culverts	300.03	
Removing slide material from box culvert mouths	539.19	
Cleaning ends of pipe culverts	609.20	
Total amount paid to contractor		63,283.94
Grand total cost of project, all state funds, 1927-28		$ 70,346.02

Hunters Creek Bridge

On the Roosevelt Coast Highway, 2.1 miles south of Gold Beach; one 32-foot, one 60-foot and three 37-foot concrete spans.

Contract No. 983, awarded June 23, 1927, to C. J. Montag Company, of Portland, Oregon. Work commenced September 12, 1927; completed May 10, 1928. Final cost $26,277.62. Resident Engineer, Frank Moore.

This bridge was designed in 1925 and bids were received in August of that year. The bids were so high that all bids were rejected. Bids were received again in June, 1927. The low bid was $3,895 less than the low bid in 1925.

The bridge replaces an old steel span which had deteriorated until it had become exceptionally dangerous.

Detailed Statement of Expenditures

Engineering		$ 2,080.79
Credit for gravel used for maintenance purposes	Cr.	74.40
Contract items as follows:		
Excavation to plan elevation, 280.5 cu. yds. at $4.50	$ 1,262.25	
Excavation below elevation, 8.9 cu. yds. at $15.00	133.50	
Piling, 873.0 lin. ft. at $1.00	873.00	
Class "A" concrete, 373.84 cu. yds. at $30.00	11,215.20	
Class "D" concrete, 154.82 cu. yds. at $24.00	3,715.68	
Metal reinforcement, 84,885 lbs. at 5c	4,244.25	
Concrete handrail, 415.0 lin. ft. at $4.00	1,660.00	
Piling cut-off, 468.0 lin. ft. at 15c	70.20	
Gravel fill, 99.2 cu. yds at 75c	74.40	
Cement adjustment, 15.0 bbls. at $4.85	72.75	
Removal of old bridge and maintenance of traffic	1,000.00	
Total amount earned by contractor	$24,321.23	
Deduction for removing sheet piling	50.00	
Total amount paid to contractor		24,271.23
Grand total cost of structure, all state funds, 1927-28		$ 26,277.62

[CURRY]

Chetco River Bridge

On the Roosevelt Coast Highway, at Brookings; three 180-foot steel spans and one 35-foot concrete span.

Contract No. 825, awarded June 25, 1925, to J. J. Badraun, of Portland, Oregon. Work commenced July 13, 1925; completed March 31, 1926. Final cost, $99,622.41. Resident Engineer, A. G. Skelton.

That portion of the structure which was included in the contract was completed March 1, 1926.

In order to make use of the old piers, it was necessary to underpin the old piers and protect the footings with riprap. This work was done by state forces under the direction of A. G. Skelton.

Further details will be found on page 274 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 4,539.32
Labor and materials furnished by the state:		
Constructing revetment for protection of piers		16,953.21
Building and maintaining temporary bridge		4,477.10
Cost of paint to be applied later by state forces		639.28
Name plates for bridge		21.26
Contract items as follows:		
Excavation, 158.34 cu. yds. at $5.00	$ 791.70	
Class "A" concrete, 120.55 cu. yds. at $25.00	3,013.75	
Class "B" concrete, 115.17 cu. yds. at $24.00	2,764.08	
Class "D" concrete, 320.98 cu. yds. at $25.00	8,024.50	
Metal reinforcement, 63,169.0 lbs. at 6c	3,790.14	
Structural steel, 696,881.0 lbs. at 7.59c	52,893.27	
Concrete handrail, 76.6 lin. ft. at $.00	383.00	
Removal of old structure, all	2,500.00	
Force account items:		
Cutting down piers to develop old reinforcing steel and cutting up bridge steel for additional reinforcement in pier caps and abutments	140.89	
Additional bracing and anchoring of temporary bridge	307.02	
Building temporary runway along new bridge for use while concrete roadway was setting up	245.53	
Removing balance of temporary bridge piling after washout	49.57	
Total amount earned by contractor	$74,903.45	
Deductions:		
Painting bridge steel by state forces	1,393.76	
Cement adjustment, under-run	517.45	
Total amount paid to contractor		72,992.24
Grand total cost of structure, all state funds		$ 99,622.41

Segregation of Funds

Expended 1925-26 biennium	$87,868.05
Expended 1927-28 biennium	11,754.36
Total of expenditures	$99,622.41

Pistol River Bridge

Federal Aid Project No. 113-A

On the Roosevelt Coast Highway, 13.7 miles south of Gold Beach; two 160-foot steel spans with three 40-foot concrete approach spans. Included with this contract were two pile trestle bridges, one 39 feet long and one 116 feet long.

Contract No. 925, awarded September 28, 1926, to C. J. Montag Company, of Portland, Oregon. Work commenced March 21, 1927; completed January 25, 1928. Final cost, $68,681.94. Resident Engineer, Frank Moore.

[CURRY]

This contract was let in September, 1926, but due to the condition of the roads over which material was to be hauled, no work was done until March, 1927. It replaces an old combination span about one-half mile above the present location.

Further details will be found on page 274 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,261.23
Name plates furnished by the state		29.28
State-owned equipment rental to the contractor		310.00
Contract items as follows:		
Crook Creek pile trestle, Sta. 716		
Cedar trestle piling, 365.0 lin. ft. at $1.15	$ 419.75	
Cedar lumber, 2.218 M-FBM at $80.00	177.44	
Cedar superstructure, 39.9 lin. ft. at $20.00	798.00	
Piling cut-off, 21.0 lin. ft. at 18.9c	3.97	
Anchoring deck to piling to protect against highwater	27.26	
Pile trestle, at Sta. 724		
Cedar trestle piling, 843.8 lin. ft. at $1.15	970.37	
Cedar lumber, 3.986 M-FBM at $80.00	318.88	
Cedar superstructure, 115.6 lin. ft. at $20.00	2,312.00	
Piling cut-off, 68.0 lin. ft. at 18.9c	12.85	
Anchoring deck to piling to protect against highwater	63.78	
Pistol River Bridge at Sta. 732		
Excavation to plan elevation, 499.9 cu. yds. at $5.00	2,499.50	
Excavation below elevation, 179.2 cu. yds. at $10.00	1,792.00	
Foundation piling, 1,636.0 lin. ft. at 80c	1,308.80	
Piling cut-off, 1,184.0 lin. ft. at 18.9c	223.78	
Class "A" concrete, 298.18 cu. yds. at $27.00	8,050.86	
Class "B" concrete, 156.0 cu. yds. at $23.00	3,588.00	
Class "D" concrete, 257.61 cu. yds. at $23.50	6,053.84	
Metal reinforcement, 78,477.0 lbs. at 5.5c	4,316.24	
Structural steel, 414,801.0 lbs. at 7.5c	31,110.08	
Concrete handrail, 250.0 lin. ft. at $4.00	1,000.00	
Excess cement used, 61.5 bbls. at $5.37	330.25	
Furnishing and installing wooden guard rail posts	13.78	
Total amount earned by contractor	$65,391.43	
Deduction for rental of state-owned equipment	310.00	
Total amount paid to contractor		65,081.43
Grand total cost of structure		$ 68,681.94

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$ 1,158.30	$	$ 1,158.30
Expended 1927-28 biennium	29,299.74	38,223.90	67,523.64
Total of expenditures	$30,458.04	$38,223.90	$ 68,681.94

Rogue River Ferry

On the Roosevelt Coast Highway, from Wedderburn to Gold Beach; Diesel-powered ferry.

Contract No. 967, awarded March 29, 1927, to St. Helens Ship Company, of St. Helens, Oregon. Work commenced May 15, 1927; completed August 20, 1927. Final cost, $20,655.20. Resident Engineer, Royal Archibald.

This ferry across the Rogue River, between Wedderburn and Indian Creek, is the connecting link in the southern part of the Roosevelt Coast Highway. This site is near the proposed location of the future Rogue River bridge and enables traffic to cross the river without the two-mile detour over poor roads via the county ferry at Bagnalls.

[CURRY]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,659.86
One metal life boat		50.00
Fifty life preservers		102.00
Miscellaneous labor and equipment		679.15
Contract price of boat	$18,250.00	
Deduction for labor and materials furnished	85.81	
Total amount paid to contractor		18,164.19
Grand total cost of boat, all state funds, 1927-28		$ 20,655.20

Ferry Slips at Rogue River

On the Roosevelt Coast Highway, on each side of Rogue River between Wedderburn and Gold Beach.

These slips are provided with sliding landing platforms which travel on a fixed track in such a manner that the platform floats at the same level as the boat rises and falls with the tide. The platforms are anchored to the slip incline by means of wheels which run between two pairs of upper and lower rails. On landing, the ferry and platform are held solidly in contact by means of a simple locking device. This arrangement assures safety to cars and passengers while getting on and off the ferry; prevents the whipping effect so common to hinged landing aprons, and overcomes the narrow bottleneck effect commonly found on float-supported, hinged landing approaches. The slips have a continuous, fixed support through the wheels on the track and have no loose aprons to interfere with a speedy and safe landing of the boat.

The Highway Commission advertised that bids would be accepted May 24, 1927, for this work. No bids were received and the work was done by state forces under the direction of A. G. Skelton. Expenditures have amounted to $24,951.45 from State funds.

Bridge Over Euchre Creek

On Roosevelt Coast Highway, 12.7 miles north of Gold Beach; three 30-foot concrete spans.

Contract No. 982, awarded June 23, 1927, to D. P. Plymale, of Bandon, Oregon. Work commenced July 11, 1927; completed November 10, 1927. Final cost, $10,091.76. Resident Engineer, Frank Moore.

This structure replaces a wooden bridge that had failed the preceding winter. Excavation disclosed the fact that the character of the foundation material was such as to require piling under the footings. These were driven by the contractor under a price agreement of $1.15 per foot.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 567.54
Riprapping stream banks		501.67
Contract items as follows:		
Excavation to plan elevation, 160.3 cu. yds. at $4.00	$ 641.20	
Excavation below elevation, 5.4 cu. yds. at $8.00	43.20	
Class "A" concrete, 100.3 cu. yds. at $28.00	2,808.40	
Class "D" concrete, 62.6 cu. yds. at $29.00	1,815.40	
Metal reinforcement, 27,395.0 lbs. at 6c	1,643.70	
Concrete handrail, 192.0 lin. ft. at $5.00	960.00	
Foundation piling, 912.4 lin. ft. at $1.15	1,049.26	
Piling cut-off, 417.6 lin. ft. at 14.7c	61.39	
Total amount paid to contractor		9,022.55
Grand total cost of structure, all state funds, 1927-28		$ 10,091.76

DESCHUTES COUNTY

The main activities in the past biennium in this county have been as follows:

The construction of 27.5 miles of the so-called "Desert" type of road on the Central Oregon Highway from Millican to Hampton. The development of Pilot Butte Park which had been given to the state. Acquiring land and building maintenance storage sheds at Bend. The construction of caretaker's quarters at Lava River Caves Park; minor betterment consisting of widening narrow cuts using the material to widen narrow fills on the McKenzie Highway at certain points between Lane County line and Redmond; erecting some guard fences at dangerous points on The Dalles-California Highway.

The Dalles-California Highway is now oiled through the county as well as the Bend-Sisters Highway, and the McKenzie Highway from a point about 7.5 miles west of Sisters through Redmond to the east county line.

The Metolius Market Road, 9.5 miles in length, running northwest from Sisters to the county line, constructed by the county as a market road with excellent grade and alignment, was taken over by the state as an integral part of the Santiam Highway and is now a part of the State Highway system and maintained by the state.

The highway work in this county has been under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend.

Bend-Lava Butte Surfacing

Federal Aid Project No. 108-D

On The Dalles-California Highway, from Bend to Lava Butte; 9.05 miles of surfacing.

Contract No. 866, awarded February 25, 1926, to Carl Nyberg, of Spokane, Washington. Work commenced June 18, 1926; completed October 6, 1926. Final cost, $89,289.67. Resident Engineer, J. R. Mitchell.

Further details will be found on page 280 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,805.04
Sprinkling surfacing materials by state forces		9,103.53
Credit by transfer of materials to maintenance account	Cr.	3,463.95
Contract items as follows:		
Base course surfacing, 11,065.0 cu. yds. at $3.20	$35,408.00	
Top course surfacing, 8,620.0 cu. yds. at $3.25	28,015.00	
Special top material, 2,345.0 cu. yds. at $3.20	7,504.00	
Screenings for oil squeegee, 85.0 cu. yds. at $2.10	178.50	
Maintenance materials, 3,449.5 cu. yds. at $2.10	7,243.95	
Earth filler, 6,062.0 cu. yds. at 40c	2,400.80	
Filler payhaul, 6,842.5 cu. yds. mi. at 16c	1,094.80	
Total amount paid to contractor		81,845.05

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$71,297.70	$18,421.44	$ 89,719.14
Expended 1927-28 biennium	Cr. 32,968.90	32,539.43	Cr. 429.47
Total of expenditures	$38,328.80	$50,960.87	$ 89,289.67

[DESCHUTES]

Pilot Butte Surfacing

On the Central Oregon Highway, from Bend to a point 1.42 miles east; 1.42 miles of surfacing.

This project being only 1.42 miles in length, and the quantities involved being small, was worked up with the idea of letting the work along with or at the same time the city of Bend was letting similar work in the city. This arrangement would provide a project of sufficient magnitude to justify a quarry set-up, taking into consideration both projects. However the arrangement did not work out satisfactorily, there being only one bid on the Pilot Butte section by a contractor who did not bid on the city work and whose bid was considered excessive. The section still remains unsurfaced.

Millican-Hampton Grading

On the Central Oregon Highway, from a point approximately one mile east of Millican to a point near Hampton; 27.5 miles of grading, "Desert" type.

Work done by state forces, using heavy caterpillar and grader owned by Deschutes County. Work commenced September, 1927. Final cost, $59,210.58. Resident Engineer, Robt. B. Gould.

Through an arrangement with Deschutes County it was possible to procure, on a rental basis, their heavy grading equipment and forces which had proved so efficient in constructing their system of market roads. The section of the Central Oregon Highway selected for improvement was very similar to that which the county forces had been working upon and which is of the so-called "Desert" type or "Grader Work." With a few exceptions, when rock was encountered or when it was necessary to construct across drainage courses, the roadway was constructed entirely by this equipment, fresnoes being used when necessary to move material laterally. Work was handled under the immediate supervision of Robt. B. Gould, who had handled similar work for the county. Owing to weather conditions it was necessary to suspend operations by the state forces during the middle of winter and in order to keep a portion of the crew and the stock in hand, it was decided to let out to contract a few short sections of the heavier work, which could be managed between storms. These contracts, however, were along the lines of "Station Work" and subject to being discontinued at any time without notice and without definite limits or quantities. This arrangement was very satisfactory as it facilitated the continuance of the work when resumed in the spring and also provided compensation to the owners of the stock and equipment which was assembled on the work.

Work was commenced on the east end of the project near Hampton and was completed to a point approximately two miles west of Brothers before having to suspend operations in the winter. The work was resumed again in the early spring and was completed to a point near Millican about June 18. A very satisfactory grade was obtained throughout the entire length, the soil being of such nature that it compacted extremely well, and provided a surface that will doubtless prove sufficient without rock surfacing under present traffic. Other sections of this highway will doubtless be constructed along similar lines.

[DESCHUTES]

Pilot Butte Grading

On the Central Oregon Highway, from the east city limits of Bend, easterly 1.41 miles; 1.41 miles of grading.

Contract No. 923, awarded September 28, 1928, to J. O. Griffiths, and Lee Hollenbeck, of Bend, Oregon. Work commenced October 12, 1926; completed May 10, 1927. Final cost, $9,028. Resident Engineers, J. R. Mitchell and H. N. Hackett.

This work consisted of grading, to standard 26-foot width, a new road around the base of Pilot Butte and the revamping of a portion of the old existing road connecting up with the section previously constructed.

Further details will be found on page 282 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,557.68
Prospecting for surfacing materials		29.09
Contract items as follows:		
Clearing and grubbing, all	$ 75.00	
Common excavation, 14,819.16 cu. yds. at 22c	3,260.31	
Solid rock excavation, 1,083.4 cu. yds. at $1.35	1,462.59	
Overhaul, 3,760.0 yd. sta. at 4c	150.40	
12-inch concrete culvert pipe, 105.0 lin. ft. at $1.25	131.25	
24-inch concrete culvert pipe, 303.0 lin. ft. at $3.40	1,030.20	
18-inch concrete siphon pipe, 30.0 lin. ft. at $2.40	72.00	
24-inch concrete siphon pipe, 210.0 lin. ft. at $3.50	735.00	
Class "A" concrete, 23.84 cu. yds. at $22.00	524.48	
Total amount paid to contractor		7,441.23
Grand total cost of project		$ 9,028.00

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$ 846.99	$	$ 846.99
Expended 1927-28 biennium	4,460.39	3,720.62	8,181.01
Total of expenditures	$ 5,307.38	$ 3,720.62	$ 9,028.00

Maintenance

With the taking over of the 15 miles of the McKenzie Highway west of Sisters, built by the Bureau of Public Roads, and the 9.5 miles of the Santiam Highway, built and constructed by Deschutes County, there are approximately 164 miles of highway in Deschutes County maintained by state forces, 107 miles of which have been surfaced and oiled, 19 miles surfaced but not oiled and 38 miles of graded roadbed.

The Dalles-California Highway is oiled its entire length through the county, also the McKenzie-Bend and the McKenzie Highway, except the west eight miles at the Lane County line.

The general maintenance consists of blading, cleaning ditches and culverts, cutting and burning weeds, removal of snow, patching of the oiled sections, etc. Of the 107 miles of oiled highways in this county, 60 miles have been oiled in the past biennium. On some sections where the grade, being of early construction and not up to our present standard, will probably have to be revised in the future, light oil was used and these sections need considerable patching. Other sections were treated with heavy oil and splendid results obtained.

Early in the spring of 1928 a rotary snow plow was used to open the McKenzie Pass and, with the use of powder to shatter and loosen the

packed snow and ice, drifts in cuts over 20 feet deep were opened. While the cost was considerable, the pass was opened and used by the traveling public at least two months earlier than it would have been otherwise.

W. S. Hodge, Resident Maintenance Engineer, located at Redmond, has supervised the maintenance operations in this county.

Redmond and Vicinity, Maintenance Materials

On The Dalles-California, McKenzie and Ochoco Highways, from the Redmond Gravel Pit, located about one mile west of Redmond. Resident Engineer, W. S. Hodge.

This work was done by state forces and equipment and consisted of getting out maintenance material to be used for maintenance and oiling operations on The Dalles-California, McKenzie and Ochoco Highways, within reasonable distances from the pit. Work and expenditures under this prefix were carried on both in 1927 and 1928, a total of 3,168 cubic yards having been taken from the pit in 1927, 300 cubic yards of which were for use on the Ochoco Highway in Crook County, and 7,250 cubic yards in 1928. Final cost, $15,067.32 from state funds. Resident Engineer, W. S. Hodge.

Sisters Section Forest Road Maintenance

Under the forest road agreement for the surfacing of the Sisters section, the state was obliged to cooperate to the extent of 50 per cent of the cost of the maintenance for a period of two years following completion of the construction.

Expenditures for the work during the biennium now closing have amounted to $310.60 from the state funds and a like amount from federal government funds. The total maintenance costs incurred by the Bureau of Public Roads for the two-year period have amounted to $12,746.42, of which the state has paid $6,373.21 and the federal government has paid a like amount.

Further details will be found on page 281 of the 1925-26 report.

Park Site North of Bend

On The Dalles-California Highway, approximately three-fourths of a mile north of the north limits of Bend.

Nothing has been done on this project other than preliminary steps taken to have a small tract of U. S. government land, which has recently been released, set aside from entry in order that the state may acquire the same for park purposes.

The county surveyor has been requested to run the lines and set corners, but this has not yet been completed.

The first fruit trees to have been planted in Deschutes County are said to be located near the bank of the Deschutes River on this tract and will add much to the beauty of the parking grounds.

[DESCHUTES]

Pilot Butte Park Development

On the Central Oregon Highway, at the east city limits of Bend. A tract containing approximately 100 acres which includes all of Pilot Butte. Development consisted of grading a roadway up to and around the summit of the Butte; also rock wall around crown, construction of range finders, and monument.

Work commenced summer of 1928; completed fall of 1928. Resident Engineer, Robert B. Gould.

This park was donated to the State of Oregon by Chas. A. Brown, Chicago, Ill.; Kemester B. Miller, Pasadena, Cal.; and Francis R. Welles, Boune, France, in memory of Terrence Haidington Foley. Pilot Butte is a cinder mountain located approximately one mile east of Bend, the top of which is about 550 feet above the surrounding country, being composed of cinders which were thrown up at one time from a crater. The Butte derived its name from early day emigrants who used this park as a landmark in locating the one available fording place on the Deschutes River. The roadway up to the summit of the Butte is a winding one, the Butte being circled about two and one-half times on a grade of approximately 10 per cent. From the top of the Butte the surrounding country can be viewed for many miles throughout the entire quadrant.

Caretaker's Quarters at Lava Caves Park

On the Dalles-California Highway, 11 miles south of Bend; one 16 by 24-foot log building.

Contract No. 976, awarded May 24, 1927, to Luther Metke, of Bend, Oregon. Work commenced June 1, 1927; completed September 1, 1927. Final cost, $2,986.69. Resident Engineer, Henry Hackett.

The state maintains a caretaker at the Lava Caves Park during the summer months. An attractive log cabin, in keeping with the appearance of the park, has been built as living quarters for the caretaker.

Equipment Shed at Bend

A 28 by 72-foot frame building with corrugated iron wall and roof.

Contract No. 1,013, awarded October 25, 1927, to John J. Cunningham, of Bend, Oregon. Work commenced October 25, 1927; completed February 1, 1928. Final cost, $4,737.26. Resident Engineer, Henry Hackett.

This shed provides storage space for the equipment and supplies of the patrol maintenance crew stationed at Bend. It also provides a shop where repairs to equipment are made.

Redmond-Bend, Relocation Survey

The survey consisted of a new location starting at the north limits of Bend and extending northerly about four miles, after which it follows closely the existing road for approximately three miles. The alignment from this point to Redmond is O. K.

[DESCHUTES]

The survey was made with the idea of eliminating the poor alignment of the existing road which was one of the earliest types and which was never surfaced with anything but pit run gravel. It would be impracticable to expend money for surfacing on the present grade. The work was done by a residency survey crew at odd times when they could take time off without interfering with their regular work.

Bend-Sage Hen Hill Survey

This survey consisted of a relocation of the present alignment, starting approximately 1.5 miles east of Bend and ending at the end of the improved section, about 12 miles east of Bend. From this point east to Sage Hen Hill an entirely new line was located. The country traversed is of such character that very good alignment was obtained. With the exception of that section known as "Horse Ridge," the line is fairly straight and has very slight grade.

Considerable time was spent on the reconnaissance so that the location was made direct, a preliminary not being necessary except on the Horse Ridge Section.

DOUGLAS COUNTY

During the 1927-28 biennium several important sections of the state highway system within the boundaries of Douglas County have been completed. Some of the most important of these have been the grading and surfacing of the Winchester Bay-Coos County line section, the grading of the Gardiner Summit section and the surfacing of the Reedsport-Winchester Bay section. All of these have been located upon the Roosevelt Coast Highway.

The Pacific Highway, being paved throughout the length of the county, has required no additional new construction work, and all work done on this particular highway has been in the nature of minor betterment and routine maintenance operations.

On the Coos Bay-Roseburg Highway a project involving 13 miles of oiling has been completed between Winston and the foot of Camas Mountain.

In February, 1926, a flood occurred in the Umpqua River which caused considerable damage on the Pacific Highway by washing out fills and undermining the pavement. These wash-out fills have been replaced and riprap for protection against similar occurrances in the future has been constructed. The flood which took place brought on the highest water which has occurred in this vicinity since 1890. According to reliable statements from some of the older residents, the high water mark during the flood of 1926 was about one and one-half feet higher than the mark resulting from the flood of 1890.

All state work on the Pacific Highway south of Roseburg and on the Coos Bay-Roseburg Highway west of Roseburg has been carried on under the direction of W. E. Chandler, Division Engineer, with headquarters at Grants Pass. All state work north of Roseburg on the Pacific Highway and all work on the Roosevelt Coast Highway within the limits of the county has been carried on under the direction of J. S. Sawyer, Division Engineer, with headquarters at Salem.

Reedsport Surfacing

Federal Aid Project No. 128-C

On the Roosevelt Coast Highway, from Sta. 476+15, which station is at the south corporate limits of the town of Reedsport, north to Sta. 532+10, which station is approximately 200 feet north of the intersection of Winchester avenue with West Railroad avenue in Reedsport; 1.06 miles of crushed gravel surfacing laid in four courses; two courses of sub-base material each three and one-half inches thick, one course of base material three inches thick, and one course of top material two inches thick 18 feet wide, and trenched.

Contract No. 1,050, awarded August 14, 1928, to F. J. Kernan, of Reedsport, Oregon. Work commenced September 11, 1928; completed October 20, 1928. Final cost, $10,133.45. Resident Engineer, P. P. Whitmore.

This small project was awarded late in the season and was performed by Contractor Kernan in connection with and at the same time he was carrying on surfacing operations between Reedsport and Lakeside.

Crushed gravel for the project was secured from the gravel bars in the Umpqua River in the vicinity of Brandy Bar located approximately

8 or 10 miles up the river from the town of Reedsport. The crushing plant consisted of the usual primary and reducing crushers and screening plant, but varied from the usual type of contractor's gravel plant equipment for the reason that it is floating equipment—the entire plant being mounted on a barge. The bar gravel was picked up with a bucket type dredge, after which it was crushed, screened and loaded on barges and shipped by water to the dock at Reedsport, from which place it was hauled to the project on light pneumatic-tired trucks.

An excellent rate of progress was maintained throughout surfacing operations on this project.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 390.31
Contract items as follows:		
Sub-base course surfacing, 2,188.0 cu. yds. at $2.10	$ 4,594.80	
Base course surfacing, 945.0 cu. yds. at $2.10	1,984.50	
Top course surfacing, 911.0 cu. yds. at $2.25	2,049.75	
Base course maintenance materials, 102.0 cu. yds. at $1.90	193.80	
Top course maintenance materials, 402.0 cu. yds. at $2.05	824.10	
Earth filler, 168.0 cu. yds. at 40c	67.20	
Filler haul, 213.0 yd. mi. at 20c	42.60	
Total amount earned by contractor	$ 9,756.75	
Deduction for haul adjustment	13.61	
Total amount paid to contractor		9,743.14
Grand total cost of project, 1927-28		$ 10,133.45

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended to date	$10,133.45	$	$ 10,133.45
Estimated cost to complete	Cr. 5,797.63	5,797.63	
Estimated total costs	$ 4,335.82	$ 5,797.63	$ 10,133.45

Reedsport-Lakeside Surfacing

Federal Aid Projects Nos. 128-A and 128-B

On the Roosevelt Coast Highway, from Sta. 476+30, which station is at the south corporate limit of the town of Reedsport, to Sta. 72+00, which station is at the junction of the Roosevelt Coast Highway with the branch road to Lakeside; 11.32 miles of crushed gravel surfacing of two types; from Sta. 476+30, the north end of project, to Sta. 190+00, which station is 1.6 miles south of Winchester Bay, in three courses: One course of sub-base material four inches thick, one course of base material four inches thick, and one course of top material four inches thick; from Sta. 190+00 to Sta. 72+00, in two courses; one course of base material four inches thick, and one course of top material four inches thick.

Contract No. 985, awarded July 28, 1927, to R. E. Johnson, assigned to F. J. Kernan, of Portland, Oregon. Work commenced September 9, 1927; completed November 30, 1928. Estimated cost, $115,000, being $54,707.58 from state funds, $14,500 from county funds, $14,500 from improvement district funds and $31,292.42 from government funds. Expenditures to date, $86,926.29, consisting of $74,049.10 from state funds, $2,000 from county funds and $10,877.19 from government funds. Resident Engineer P. P. Whitmore.

As noted above, this contract was awarded to R. E. Johnson of Portland, Oregon, on September 9, 1927, but before the beginning of any surfacing operations the contract was assigned to F. J. Kernan, Reedsport, Oregon, on September 27, 1927.

[DOUGLAS]

The specifications for this project provided for the placing of the sub-base course on the section from the south city limits of Reedsport to Winchester Bay during the fall of 1927.

The surfacing contractor experienced some delay on this portion of the work for the reason that the grading contractor ahead of him had not yet completed all of the grading work, with the result that the surfacing operations in the laying of the sub-base course had to be carried on well into the winter. Because of this delay and because the original contract contemplated that the sub-base course would be laid in dry weather, it was necessary for the state to assume the additional cost to which the contractor was put by reason of having to use tow teams to pull the gravel trucks on and off the wet subgrade. After experiencing these minor difficulties this section was rocked with sub-base course and opened to traffic in January, 1928.

The contractor operated in a limited way, placing rock on such other sections of the project as were dry enough to receive it throughout the winter and until the spring weather opened up in May. From that date the work was rapidly rushed to completion and at the writing of this report is practically complete. The total yardage of road rock has been placed and there remains to be put out only a small yardage of maintenance rock.

Material for this project was secured from bars in the Umpqua River located approximately 8 or 10 miles above Reedsport and after being crushed and screened on a floating plant was barged to Reedsport and to Winchester Bay, from where it was hauled to the road with light pneumatic-tired trucks.

Material used in the extreme south end of the work in the north end of Coos County from Lakeside northward for approximately three miles was barged to Reedsport, at which point it was transferred to Southern Pacific railroad cars and shipped to Lakeside, from where it was delivered to the road by trucks.

Reedsport Grading

Federal Aid Project No. 128-C

On the Roosevelt Coast Highway, from Sta. 476+15, which station is at the south corporate limit of Reedsport, north to Sta. 532+10, which station is approximately 200 feet north of the intersection of Winchester avenue with West Railroad avenue in Reedsport; 1.06 miles of grading, class "A" 30-foot standard roadbed.

Contract No. 1,046, awarded July 10, 1928, to Frank M. Bullis, of Corvallis, Oregon. Work commenced August 13, 1928; completed October 6, 1928. Final cost, $9,677.34. Resident Engineer, P. P. Whitmore.

This project was authorized early in 1928, but award of the work was not made until August pending negotiations with the city of Reedsport in regard to the establishment of grades and rights of way.

Although the job was started late, Contractor Bullis made excellent progress, employing one small power shovel and a fleet of trucks, together with caterpillar tractors and graders, and rushed the work to final completion in time to allow the surfacing operations to be completed ahead of the wet weather.

[DOUGLAS]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 577.67
Signs for traffic control		34.58
Placing tile drains		12.00
Contract items as follows:		
Clearing and grubbing, all	$ 50.00	
Single classification excavation, 17,850.6 cu. yds. at 38c	6,783.23	
Overhaul, 17,170 yd. sta. at 5c	858.50	
Truck haul, 5,187.3 yd. mi. at 20c	1,037.46	
6-inch porous drain tile, 190 lin. ft. at 35c	66.50	
12-inch concrete pipe, 195 lin. ft. at 90c	175.50	
18-inch concrete pipe, 42 lin. ft. at $1.95	81.90	
Total amount paid to contractor		9,053.09
Grand total cost of project, 1927-28		$ 9,677.34

PARTICIPATION IN COST

	State	County	Government	Total
Total expenditures to date	$ 6,177.34	$ 3,500.00	$	$ 9,677.34
Estimated cost to complete	Cr. 6,529.04		6,529.04	
Estimated total costs	Cr.$ 351.70	$ 3,500.00	$ 6,529.04	$ 9,677.34

Gardiner Summit Grading

Federal Aid Project No. 140-A

On the Roosevelt Coast Highway, from Sta. 736+10, which station is approximately two miles north of the town of Gardiner, north to Sta. 839+79, which station is 0.44 mile south of the Siuslaw National Forest Boundary; 1.95 miles of grading, class "A" 30-foot standard roadbed.

Contract No. 1,035, awarded April 20, 1928, to E. L. Gates, of Lakeside, Oregon. Work commenced April 29, 1928; completed September 11, 1928. Final cost, $85,961.84. Resident Engineer, Glenn E. Roberts.

This short section of the Roosevelt Coast Highway traverses an extremely rugged and broken-up section of the Coast Mountains, which was densely covered with brush and large spruce timber.

As noted above, Contractor Gates moved onto the job about the last of April and by employing an exceptionally large and efficient force on the clearing, and by the use of modern equipment such as steam shovels, tractors and power fresnoes, power graders and some stock, he was able to complete this heavy grading job within the short working season of the coast country.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,494.76
Contract items as follows:		
Clearing and grubbing, all	$16,500.00	
Common excavation, 80,229.2 cu. yds. at 36c	28,882.51	
Other excavation, 54,043.8 cu. yds. at 60c	32,426.28	
Overhaul, 54,749.0 yd. sta. at 3c	1,642.47	
Truck haul, 7,009.4 yd. mi. at 30c	2,102.82	
18-inch concrete pipe, 726 lin. ft. at $2.50	1,815.00	
8-inch porous drain tile, 392 lin. ft. at 25c	98.00	
Total amount paid to contractor		83,467.08
Grand total cost of project, 1927-28		$ 85,961.84

PARTICIPATION IN COST

	State	County	Government	Total
Expended to date	$39,586.96	$21,403.54	$24,971.34	$85,961.84
Estimated balances to complete	Cr. 17,938.43	6,418.82	11,519.61	
Estimated total costs	$21,648.53	$27,822.36	$36,490.95	$85,961.84

[DOUGLAS]

Oakland Overcrossing Approaches, Grading and Surfacing

Federal Aid Project No. 74

On the Pacific Highway, at Oakland.

Contract No. 807, awarded May 28, 1925, to Washburn & Hall of Portland, Oregon. Work commenced July 10, 1925; completed December 10, 1925. Final cost, $19,394.08. Resident Engineer, Raymond Walsh.

This project has been opened during the present biennium only to record the receipt of $6,421.34 as final county cooperation.

Further details will be found on page 289 of the 1925-26 report.

Winchester Bay-Lakeside Grading

Federal Aid Project No. 128-B

On the Roosevelt Coast Highway, from Sta. 291, at the north edge of the town of Winchester Bay, south to Sta. 130, approximately 1.5 miles north of Lakeside, being 5.57 miles in Douglas County and 1.35 miles in Coos County; 6.92 miles of grading, class "A" roadbed.

Contract No. 922, awarded September 28, 1926, to E. L. Gates, of Foster, Oregon. Work commenced November 1, 1926; completed June 15, 1927. Final cost, $230,042.12. Resident Engineer, P. P. Whitmore.

The contract for the grading of this section of the Roosevelt Coast Highway was awarded in the late fall of 1926 with the plan in mind that the contractor would be able to do a considerable amount of the heavy clearing involved during the fall and winter of 1926 and 1927, at which time burning operations could be carried on with a minimum hazard of spreading fire.

The contractor moved onto the job promptly with a considerable force of men and equipment and carried out the plan of doing the clearing work and some short sections of grading during the winter season, which, in turn, permitted him to complete the grading work at an early date.

The project traverses a rugged, mountainous country presenting a variety of difficulties, such as drift sand dunes along Clear Lake which had first to be graded, using the sand material in the original roadbed and, later, covered with a blanket of clay which had to be hauled quite a long distance, to the other extreme of rough mountain construction alternating heavy rock and grade cuts and fills.

One interesting feature of the work was the method employed to overcome the so-called "sand menace." The southern portion of this project, from a point approximately one-half mile south of the Douglas-Coos County line to Lakeside traverses a jack pine, sand flat through which Clear Creek, the outlet of Clear Lake, originally wandered, carrying with it, during storm periods, thousands of tons of drift sand which the stream picked up along the sand dunes to the north of this section and which, at times, made the maintenance of a roadbed for a highway through this flat impossible for the reason that it would be either buried with sand or washed out completely, according to the meanderings of the stream.

To protect the highway against this so-called "sand menace," a diversion canal, known in the department records as "The Clear Creek Channel Change," was built, which picks up the water of Clear Creek at a point near the Douglas-Coos County line and carries it through the canal,

[DOUGLAS]

which is built around a clay sidehill, to Eel Lake, a total distance of approximately three-quarters of a mile. The point of diversion in Clear Creek lies above the sand dunes so that in carrying the water around the clay hillside in the new canal it has no opportunity to pick up blow sand and is emptied into Eel Lake free from a great burden of sand it originally carried. This Clear Creek channel change will not only protect and insure the highway against the sand menace, but in time will tend to lower the Eel Creek and Ten-Mile Creek channels, with the ultimate result that Ten-Mile Lake and North Lake will be lowered several feet, which lowering will be a great aid to farmers around the upper reaches of the lakes.

Further details will be found on page 291 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 11,399.70
Labor and materials furnished by the state:		
Removing slides and widening roadbed		692.44
Extending pipe culverts		45.79
Removing and relaying pipe line		31.50
Constructing tile drains		27.42
Signs for control of traffic		21.64
Seeding slopes		59.32
Constructing guard fence		965.65
Subcontractor's labor claims paid by state		4,889.15
Contract items as follows:		
Clearing and grubbing, all	$ 23,700.00	
Clearing right-of-way for channel change, all	2,000.00	
Common excavation, 169,628.0 cu. yds. at 36c	61,066.08	
Sand excavation, 153,394.2 cu. yds. at 32c	49,086.14	
Other excavation, 73,989.4 cu. yds. at 55c	40,694.17	
Overhaul, 324,710.0 yd. sta. at 4c	12,988.40	
12-inch concrete pipe, 186.0 lin. ft. at $1.15	213.90	
18-inch concrete pipe, 1,875.0 lin. ft. at $2.50	4,687.50	
24-inch concrete pipe, 915.0 lin. ft. at $3.40	3,111.00	
36-inch concrete pipe, 312.0 lin. ft. at $6.38	1,990.56	
Class "B" concrete, 16.31 cu. yds. at $23.00	375.13	
Lumber and timber, 86,645 M-FBM at $50.00	4,332.25	
Timber piling, 1,939.0 lin. ft. at 85c	1,648.15	
6-inch porous drain tile, 1,830.0 lin. ft. at 20c	366.00	
Clay blanket, 9,607.2 cu. yds. at $1.00	9.607.20	
Extra haul on clay blanket, 1,409.0 yd. mi. at 20c	281.80	
Force account items:		
Constructing log crib at Winchester Creek Bridge	114.32	
Building log boom on each side Winchester Creek Bridge	101.57	
Constructing cedar log cribbing Sta. 51	42.73	
Hauling and placing rock backfill in drains	90.49	
Calking cracks in timber structures of Clear Creek Canal	33.51	
Extra clearing and grubbing	267.76	
Total amount earned by contractor	$216,798.66	
Deduction for labor claims paid by state	4,889.15	
Total amount paid to contractor		211,909.51
Grand total cost of project		$230,042.12

PARTICIPATION IN COST

	State	*County*	*District*	*Government*	*Total*
Expended 1925-26 biennium Cr.	$5,080.96	$ 5,411.09	$	$	$ 330.13
Expended 1927-28 biennium	75,107.52	30,000.00	15,000.00	109,604.47	229,711.99
Expended to date:	$70,026.56	$35,411.09	$15,000.00	$109,604.47	$230,042.12
Estimated cost to complete Cr.	36,753.01	.....	15,000.00	21,753.01	.....
Estimated total cost	$33,273.55	$35,411.09	$30,000.00	$121,357.48	$230,042.12

[DOUGLAS]

Reedsport-Winchester Bay Grading

Federal Aid Project No. 128-A

On the Roosevelt Coast Highway, from Sta. 476+30, which station is at the south or west corporate limits of the town of Reedsport, south to Sta. 291+00, which station is in the town of Winchester Bay; 3.29 miles of class "A" 24-foot standard grading.

Contract No. 891, awarded June 24, 1926, to Schell & Rhodes, of Oakland, Oregon. Work commenced August 1, 1926; completed December 3, 1927. Final cost, $95,879.49. Resident Engineer, P. P. Whitmore.

As will be seen by referring to page 290 of the 1925-1926 biennial report, this project was commenced during the last biennium and at the time of that report the contractors, Schell & Rhodes, had completed most of the clearing, had installed several of the pipe culverts, had constructed several of the large concrete box culverts and completed approximately one and one-half miles of the grading work, after which time they closed down operations for the winter with the major part of their equipment, keeping on the job during the winter only one donkey and drag line outfit, which outfit continued to work throughout the winter months in the large summit cuts.

During the early part of 1927 power shovel and truck equipment was substituted for the drag line outfit and as early as weather conditions would permit the horses were again moved onto the job and the final grading work was completed in the fall of 1927, but hardly in time to permit the surfacing contractor to do his part of the work before the rainy season set in.

Further details will be found on page 290 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 4,303.54
Reconstructing water system in city of Reedsport		1,196.64
Contract items as follows:		
Clearing and grubbing, all	$12,000.00	
Common excavation, 58,896.83 cu. yds. at 45c	26,503.57	
Intermediate excavation, 4,802.2 cu. yds. at 45c	2,160.99	
Solid rock excavation, 47,615.54 cu. yds. at 60c	28,569.32	
Overhaul, 285,045.0 yd. sta. at 3c	8,551.35	
18-in. concrete pipe, 813.0 lin. ft. at $3.00	2,439.00	
24-in. concrete pipe, 225.0 lin. ft. at $4.00	900.00	
36-inch concrete pipe, 252.0 lin. ft. at $7.00	1,764.00	
Class "A" concrete, 177.46 cu. yds. at $25.00	4,436.50	
Metal reinforcement, 22,940.0 lbs. at 7c	1,605.80	
6-inch porous drain tile, 1,480.0 lin. ft. at 25c	370.00	
Force account items:		
Reconstructing Reedsport water main, stations 399 to 409	866.85	
Removing slide at station 410	180.71	
Removing dangerous trees and snags adjacent to right of way	31.22	
Total amount paid to contractor		90,379.31
Grand total cost of project		$ 95,879.49

PARTICIPATION IN COST

	State	County	Improvement District	Government	Total
Expended 1925-26	$22,396.47	$	$	$	$ 22,396.47
Expended 1927-28	6,913.95	13,000.00	13,000.00	40,569.07	73,483.02
Total expenditures	$29,310.42	$13,000.00	$13,000.00	$40,569.07	$ 95,879.49
Estimated cost to complete ..Cr.	9,920.93	.....	.....	9,920.93	.....
Total estimated costs	$19,389.49	$13,000.00	$13,000.00	$50,490.00	$ 95,879.49

[DOUGLAS]

Two Bridges Over Canyon Creek

On the Pacific Highway, one mile and 1.8 miles, respectively, south of Canyonville; each bridge consisting of one 71-foot steel span.

Contract No. 941, awarded January 27, 1927, to O. N. Pierce Company, of Portland, Oregon. Work commenced April 10, 1927; completed September 10, 1927. Final cost, $14,605.31. Resident Engineer, R. G. Barnes.

These structures replace temporary timber trusses built by the Bureau of Public Roads at the time the section was graded. The existing substructures were used with changes to accommodate the wider roadway of the new superstructure.

Detailed Statement of Expenditures

Engineering		$ 1,537.85
Name plates furnished by the state		24.27
Credit by sale of lumber and bolts to local parties		Cr. 5.22
Bullseye reflectors sold to contractor		72.00
Contract items as follows:		
Class "A" concrete, 32.21 cu. yds. at $22.00	$ 708.62	
Class "D" concrete, 55.73 cu. yds. at $22.00	1,226.06	
Metal reinforcement, 10,850.0 lbs. at 6c	651.00	
Structural steel, 122,066.0 lbs. at 7c	8,544.62	
Lumber, 20.669 M-FBM at $50.00	1,033.45	
Removing old bridge and maintenance of traffic	750.00	
Force account items:		
Furnishing lumber and constructing engineer's tent house	20.21	
Make wedges for and split dowels to be used in abutment	50.16	
Supply bolts end of stringers	55.38	
Install copper stops and asphalt drip boards	93.15	
Total amount earned by contractor	$13,132.65	
Deductions:		
Cement correction, 27.0 bbls. at $3.12	84.24	
12 bullseye reflectors furnished by the state	72.00	
Total amount paid to the contractor		12,976.41
Grand total cost of structures, all state funds, 1927-28		$14,605.31

Scottsburg Bridge

Federal Aid Project No. 142-A

On the Drain-Reedsport Road, over the Umpqua River at Scottsburg; 632-foot steel truss continuous over four supports.

Contract No. 1,042, awarded May 29, 1928, to Clackamas Construction Company, of Portland, Oregon. Work commenced June 12, 1928. Estimated cost, $112,000, consisting of $22,748.54 each from county and improvement district funds and $66,502.92 from government funds. Expenditures to date amount to $15,086.89 and the state has received $22,500, each, for advance cooperation from the county and district. Resident Engineer, C. A. Jordan.

This structure is being financed under cooperative agreement by the Bureau of Public Roads, the Umpqua Super-road District and Douglas County. The design and construction are under supervision of the highway department. The construction schedule calls for the building of the main piers during the summer of 1928, and the completion of the structure during the season of 1929. The work is progressing satisfactorily according to this schedule.

[DOUGLAS]

Schofield River Bridge

Federal Aid Project No. 128-C

On the Roosevelt Coast Highway, at Reedsport; six 19-foot pile trestle spans, one 18-foot I-beam retractable draw span and eight 19-foot pile trestle spans.

Contract No. 1,032, awarded March 27, 1928, to O. M. Olds, of Oak Grove, Oregon. Work commenced April 17, 1928; completed August 30, 1928. Estimated cost, $24,000. Resident Engineer, Frank Moore.

This structure is a link in the section of the Roosevelt Coast Highway between Reedsport and Coos Bay. It replaces a timber structure that had been condemned for all but the lightest traffic for several years.

This bridge has been completed, but the old bridge has not been removed. The old bridge will not be removed until the city of Reedsport removes their water main from the old bridge. This they cannot do until they receive permission from the War Department. Two hundred dollars is being withheld from the contractor until the old structure is removed.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,416.65
Surfacing bridge deck		180.61
Materials furnished by state		180.21
Contract items as follows:		
Removal of old bridge and maintenance of traffic	$ 4,000.00	
Cedar piling, 4,218.7 lin. ft. at 80c	3,374.96	
Fir piling, 2,069.0 lin. ft. at 73c	1,510.37	
Cedar lumber, 74.271 M-FBM at $60.00	4,456.26	
Trestle superstructure 273.8 lin. ft. at $16.00	4,380.80	
Structural steel, 63,805.0 lbs. at 6c	3,828.30	
Cedar piling cut-off 72.1 lin. ft. at 29c	20.91	
Fir piling cut-off 329.0 lin. ft. at 11c	36.19	
Allowance for increased cost of deck, 76.120 M-FBM at $6.75	513.81	
Force account items:		
Cut and drill bed plates for steel stringers	16.70	
Drill beams to bolt decking ad cut strut angles to clear rollers	13.86	
Edge-spiking on decking of steel span	35.44	
Total amount earned by contractor	$22,187.60	
Deductions:		
Detained until removal of old bridge	200.00	
Final estimate in process of payment	2,647.36	
Total amount paid to contractor		19,340.24
Grand total expended on structure, 1927-28		$21,117.71

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended to date	$3,675.77	$6,500.00	$10,941.94	$21,117.71
Estimated balances to complete	1,352.09	.....	1,530.20	2,882.29
Estimated total costs	$5,027.86	$6,500.00	$12,472.14	$24,000.00

Oakland Overcrossing

Federal Aid Project No. 74

On the Pacific Highway, at Oakland; one 100-foot steel deck span and 170 lineal feet of concrete viaduct.

Contract No. 767, awarded January 14, 1925, to L. W. Metzger, of Roseburg, Oregon. Work commenced February 17, 1925; completed

November 20, 1925. Final cost, $48,223.32. Resident Engineers, J. T. Skelton to June 6, 1925, then Marshall Dresser to completion.

This project has been opened during the present biennium only to record the receipt of $13,169.74 as final cooperative payment from Douglas County. The final cost now consists of a credit to state funds of $2,669.37, county funds $15,671.58, government funds $29,255.91 and $5,965.20 from the Southern Pacific Company.

Further details will be found on page 292 of the 1925-26 report.

Maintenance

During this biennium the maintenance of all state highways within the boundaries of Douglas County that have been improved to state standards and surfaced with paving or macadam, has been done by the state with its own forces and equipment.

This work has consisted of the general maintenance of roadbeds, rights of way, drainage, surfaces, shoulders and guard fences and any other work in the nature of general maintenance.

The Pacific Highway which crosses Douglas County from north to south has been paved with concrete or bituminous pavement for some time, except the four short gaps known as the Oakland, Sutherlin, Wilbur and Shady gaps, which were given an application of heavy oil for the first time during the summer of 1926. Since that time, during 1927 and again during 1928, these gaps have been reoiled or repaired and are still being carried as oiled sections quite successfully. The bituminous pavement on the Pacific Highway has been treated with the usual amount of repair patching.

Other highways in Douglas County upon which state highway maintenance funds have been spent are:

The Coos Bay-Roseburg Highway from Roseburg to the Coos County line; and the Roosevelt Coast Highway from Gardiner Summit to the Umpqua River and from Reedsport to the Coos County line.

Maintenance work in the county is divided at Roseburg, the work to the south and west of Roseburg being done under the direction of Wm. E. Chandler, Division Engineer, Grants Pass, Oregon, and W. H. Strohmeyer, Resident Engineer, Roseburg, Oregon, and to the north of Roseburg under the direction of J. S. Sawyer, Division Engineer, Salem, Oregon, and Raymond Walsh, Resident Engineer, Eugene, Oregon.

George W. Short Material Site

During the winter of 1926-1927, in order to provide a site from which material could be taken for the repair and maintenance of the Pacific Highway in the northern part of Douglas County, investigations were made and later the George W. Short material site was purchased at a price of $500.

This site is located closely adjacent to the Pacific Highway at a point approximately one-quarter mile north of the town of Wilbur and consists of a tract having an area of approximately five acres, being

[DOUGLAS]

300 feet east and west and 726 feet north and south, and an easement roadway 20 feet in width and approximately 400 feet in length, connecting the material site with the Pacific Highway.

This site provides maintenance material in the nature of a fine, conglomerate talus which has excellent binding qualities and wears well on the shoulders.

The total expenditures involved have amounted to $540 from state funds.

Mystic Creek-Winston Maintenance Materials

On the Coos Bay-Roseburg Highway, from the gravel bar in Ten-mile creek, approximately six miles west of the junction with the Pacific Highway; about 22 miles of highway to be maintained and oiled with the materials placed in stock piles.

Contract No. 945, awarded January 28, 1927, to A. S. Wallace, of Roseburg, Oregon. Work commenced February 14, 1927; completed August 16, 1927. Final cost, $24,482.95. Resident Engineer, W. M. Strohmeyer.

This maintenance material was crushed with heavy oiling in mind.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 855.35
Royalty paid for gravel surfacing materials		498.89
Preparation of stock pile sites		120.45
Credit for material used in Pacific Highway pavement repair		Cr. 248.86
Contract items as follows:		
Grade "A" crushed gravel, 1,963.2 cu. yds. at $2.73	$ 5,359.54	
Grade "B" crushed gravel, 7,485.6 cu. yds. at $2.33	17,441.45	
Grade "C" crushed gravel, 529.0 cu. yds. at $1.25	661.25	
Total amount earned by the contractor	$23,462.24	
Deduction account of reduced average haul	205.12	
Total amount paid to contractor		23,257.12
Grand total cost of project, all state funds, 1927-28		$ 24,482.95

The Umpqua Highway Improvement District

As reported on page 291 of the 1925-1926 biennial report, the Umpqua Highway Improvement District was finally organized and approved by the voters of the district and made a tax-levying body on January 25, 1925, by a substantial majority.

Since that time this district has been very progressive in financing their portion of the cooperation for the construction of the Umpqua Highway and Roosevelt Coast Highway from Reedsport to the Coos County line, and the location survey from Drain to Scottsburg.

At the recent regular election held November 6, 1928, this district again came into the limelight with their progressiveness and voted a bond issue of $110,000, which is to be used as the district's contribution towards the construction of the Umpqua Highway between Drain and Scottsburg in cooperation with the federal government.

[DOUGLAS]

Yoncalla Dike Right of Way

During the summer of 1927, in connection with the construction of a small earth dike between the embankment of the Pacific Highway and the embankment of the Southern Pacific Railroad on the L. W. Wise farm about one and one-half miles south of Yoncalla, it was found necessary and advisable to procure some right of way.

Negotiations were, therefore, entered into with Mr. Wise for the securing of such a right of way with the final result that a perpetual easement right of way 50 feet in width and 287 feet in length was secured for the purchase price of $50.

Negotiations for the right of way and the construction of the dike were carried on under the supervision of Raymond Walsh, Resident Engineer, Eugene, Oregon.

Scottsburg-Drain Survey

Between January 1 and August 6, 1927, this location survey was made under the direction of the Oregon State Highway Commission at the instance of the county court of Douglas County and the Umpqua Highway Improvement District, jointly.

In choosing the route for the location of this important highway, several alternates presented themselves, the first one being the choice of the route of a lower or western one and one-half miles of the line, which involved the bridging of the Umpqua River. In these alternates two complete location surveys were made, one following up along the south bank of the Umpqua River and crossing over the river at a point about one and one-half miles above Scottsburg, and the second alternate crossing the Umpqua River just immediately below Scottsburg, thence following along the north bank of the river through Scottsburg and eastward to a connection with the first alternate. The second alternate was chosen and the final location made on that survey for the reason that it was a shorter and more economical line.

Continuing up along the north shore of the Umpqua River no serious obstacles in the survey were met until the line reached Hancock Mountain. At this point preliminary investigations and surveys were made of three alternate routes: One following a water grade up along Elk Creek from the Hancock Ranch to the Red Bridge; a second alternate followed approximately the line of the present traveled road over the Hancock Mountain; and a third alternate, being the one which was finally chosen as the location of the highway, followed up along Elk Creek from the Hancock Ranch for a short distance, then tunneled through Hancock Mountain with a tunnel approximately 1,100 feet in length and joining the other two alternate lines at the Red Bridge, which is approximately 10 miles west of Drain. From the Red Bridge to Drain the final location was laid along the north shore of Elk Creek intersecting the Pacific Highway with a satisfactory wye connection with both north and south bound traffic at Drain.

Field work on this survey from Scottsburg to Hancock Mountain, which was made during the early part of the year, was done under the direction of C. R. Burns, Location Engineer, Elkton, Oregon, and the remaining portion of the line from Hancock Mountain to Drain was done under the direction of H. W. Libby, Location Engineer, Elkton, Oregon.

[DOUGLAS]

Gardiner-Lane County Line Survey

During the last half of 1927 and at different times during 1928 this relocation survey was made with a small party such as is ordinarily used on construction work, and has consisted of the relocation to new and up-to-date standards of the original survey made several years ago, because of the fact that a very much higher standard of alignment and roadbed width is being used. The construction cost of the highway will be increased, but the increase in cost is justified by the better line.

This survey was made under the direct supervision of Glenn E. Roberts, Resident Engineer, Gardiner, Oregon, in connection with construction work that was under way during the same period.

Ewing Quarry-Oakland Survey

The Pacific Highway between Ewing quarry and a point immediately north of the Oakland Bridge and overcrossing is built and paved on alignment having quite sharp and dangerous curvature and some steep grades.

This survey consisted of a relocation survey between the two above named points and as is usually the case, several alternates were investigated, any of which would be quite satisfactory. Preliminary and located lines have been run on the several alternates, but at this time definite decision has not been made as to which of the alternates will be used. However, the general route follows quite closely the route of the present improved highway but eliminates the objectionable grade and curvature.

This survey was made with a small party under the direction of Glenn E. Roberts, Resident Engineer, Gardiner, Oregon, between April 6, and June 11, 1927.

GILLIAM COUNTY

During the biennium just closed considerable work has been done on the highways in this county. The Columbia River Highway through the county has been put in excellent condition by the application of a heavier grade of oil.

The John Day Highway was resurfaced from Arlington to a point 11 miles south. During the two years just passed the highway has been treated with heavy oil from Arlington to Condon, a distance of approximately 38 miles, and is in splendid condition and holding up well. Contracts were let not only for the resurfacing and getting out the crushed rock or gravel necessary for the heavy oiling on the Columbia River Highway and the John Day Highway to Condon but also sufficient to extend the oiling program from Condon to Fossil, a distance of 21 miles. It is proposed to oil this section during the 1929 season.

A heavy cloudburst struck the John Day Highway about five miles south of Arlington and the waters rushing down China creek not only took out the big embankment on the Columbia River Highway in the town of Arlington itself (which has been replaced by the highway department by a bridge) but completely washed out the highway at two other points where the drainage structures would not carry the water and also where the creek paralleled the roadway for quite a distance. Only about one-half the roadway was left. Fortunately detours were rapidly made and travel was not very much inconvenienced while the repairs to the highway were being made. This same cloudburst not only damaged the highway but took out railroad bridges, floated the tracks off their roadbed, undermined and destroyed buildings in Arlington and filled its main street with all kinds of debris, and filled the basements of those buildings that withstood the onrush of the waters, with mud. Fortunately no lives were lost.

A few minor betterments, consisting of installing new culverts, widening narrow fills and widening of curves to improve alignment, were made.

The state highway work within the county was under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend, excepting approximately one mile of the Columbia River Highway at the east county line and 9.6 miles of the Oregon-Washington Highway, which are under the supervision of H. G. Smith, Division Engineer, located at La Grande.

Maintenance

Division No. 4:

The maintenance of the highways in this county was rather heavy during the past two years due to unusual weather conditions. The cloudburst which happened in January, 1928, caused the most serious trouble, washing out the roadway in many places in the five miles of the John Day Highway just south of Arlington and on the Columbia River Highway in Arlington. However, the maintenance crews from adjoining sections were rushed to the scene of action, extra labor secured, and repair work was soon underway and the highways put in good condition in a short time.

The maintenance work in general, outside taking care of cloudburst damage, has consisted of blading, dragging, cleaning of ditches, removal of slides, repairs and extension of the drainage system and patching the oiled sections.

[GILLIAM]

The minor betterments consisted of the installation of some extra culverts, widening of narrow fills and some flattening of curves to improve alignment. The maintenance work on the Columbia River Highway from the John Day River to Quinton was under the supervision of K. D. Lytle, Resident Maintenance Engineer, located at The Dalles. The maintenance work on the Columbia River Highway from Quinton to Heppner Junction and the John Day Highway through the county was under the supervision of J. R. Mitchell, Resident Maintenance Engineer, located at Condon.

Division No. 5:

Practically all of the maintenance work in Gilliam County is under the direction of Division No. 4. There are, however, approximately one mile on the Old Oregon Trail and 9.59 miles on the Oregon-Washington Highway in Division No. 5.

Crushed maintenance materials on the sections of highways in Division No. 5 had become exhausted and in order to secure a new supply, a contract was let in 1927; this contract has been completed and materials are now available for future maintenance work.

The section of the Oregon-Washington Highway from Heppner Junction to the Morrow County line, 9.59 miles, was surface treated with oil in 1928.

The maintenance work on the Old Oregon Trail is in charge of E. T. Messenger with headquarters at Boardman. The section on the Oregon-Washington Highway is in charge of W. Sexton with headquarters at Ione in Morrow County. C. E. Carter is Resident Maintenance Engineer, with headquarters at Pendleton. All maintenance work in Division No. 5 is under the general direction of Mr. H. G. Smith at La Grande.

Olex-Fossil Maintenance Materials

On the John Day Highway, from Olex to Fossil.

Contract No. 1,016, awarded November 29, 1927, to H. E. Schmeer, of Portland, Oregon. Work commenced February 24, 1928; completed September 4, 1928. Estimated cost, $48,000 from state funds. Resident Engineer, A. A. Kirkwood.

Materials were secured from two quarries, one located approximately three-tenths of a mile east of Mile Post 28.4 and approximately three-quarters of a mile north of the town of Gwendolen, and one located approximately two-tenths of a mile east of the highway at Mile Post 51.0, which post is in the town of Mayville. The work was divided into two units. The north unit is 21 miles in length and extends from Mile Post 17.0 near the town of Olex to Mile Post 38.0 in the town of Condon. The south unit is 17.5 miles in length and extends from Mile Post 42, which mile post is about four miles south of Condon, to Mile Post 59.5 in the town of Fossil. Materials were stock piled at points designated by the department, and a small quantity was delivered into state trucks at the bunkers.

[GILLIAM]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,432.75
Purchase of quarry site		155.00
Lease of stock pile sites		156.92
Construction of signs for traffic control		16.15
Contract items as follows:		
North Unit:		
Grade "A" materials in stock piles 2,507.1 cu. yds. at $1.34	$ 3,359.51	
Grade "B" materials in stock piles 5,453.1 cu. yds. at $1.28	6,979.97	
Grade "C" materials in stock piles 4,794.4 cu. yds. at $1.03	4,938.23	
Truck haul (stock pile measure) 54,478.0 yd. mi. at 18c	9,806.04	
Grade "A" materials in trucks 231.0 cu. yds. at $1,24	286.44	
Grade "B" materials in trucks 73.0 cu. yds. at $1.18	86.14	
Grade "C" materials in trucks 36.0 cu. yds. at $0.95	34.20	
Truck haul(truck measure) 1,186.0 yd. mi. at 16c	189.76	
Force account items:		
Preparing stock pile sites	410.25	
Moving right-of-way fence	45.20	
South Unit:		
Grade "A" material in stock piles 2,964.7 cu. yds. at $1.19	3,527.99	
Grade "B" materials in stock piles 4,969.1 cu. yds. at $1.14	5,664.77	
Grade "C" materials in stock piles 2,692.5 cu. yds. at $1.00	2,692.50	
Truck haul (stock pile measure) 38,337.0 yd. mi. at 18c	6,900.71	
Force account items:		
Preparing stock pile sites	303.40	
Constructing cattle guard	94.50	
Total amount earned by contractor	$45,319.61	
Less final estimate in transit	1,082.20	
Total amount paid to contractor		44,237.41
Grand total expended on project, all state funds 1927-28		$46,998.23

Reconstruction of Bridge in Arlington

On the Columbia River Highway, at Arlington. Final cost, $3,533.90. Resident Engineer, M. Stephenson.

This structure replaces a 6 by 6 culvert and fill in the city of Arlington. The fill was washed out during the cloudburst of 1927, and in order to provide more waterway was replaced by a pile trestle. The work was done by state forces under the direction of M. Stephenson.

Blalock-Arlington Relocation Survey

This was only a very short survey made by Resident Engineer Lytle to eliminate some poor alignment. The work was done at odd times, with the idea of having the data available whenever it was deemed advisable to make the change.

Arlington-Shutler Creek Resurfacing and Maintenance Materials

On the John Day Highway, from Sta. 1960+00 at Arlington to Sta. 1380+00 at a point south of the west fork of Shutler Creek; 11 miles of broken stone surfacing and the furnishing of approximately 12,000 cubic yards of maintenance materials for use on the Columbia River and John Day Highways in the vicinity of Arlington.

Contract No. 928, awarded October 26, 1926, to the Triangle Construction Company, of Spokane, Washington. Work commenced January 10, 1927; completed July 6, 1927. Final cost, $33,446.49. Resident Engineer, J. R. Mitchell.

[GILLIAM]

This project covers both the Arlington section and the Arlington-Shutler Creek section.

Further details will be found on page 301 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,638.29
Purchase of quarry sites		290.00
Sprinkling surfacing materials		1,408.35
Lease of ground for stock pile site		25.00
Credit for crushed rock sold to private party		Cr. 77.00
Contract items as follows:		
Materials east of Arlington		
Grade "A" materials, 333.0 cu. yds. at $1.35	$ 449.55	
Grade "B" materials, 940.2 cu. yds. at $1.00	940.20	
Hauling materials, 5,092.8 yd. mi. at 18c	916.70	
Materials west of Arlington		
Grade "A" materials, 640.9 cu. yds. at $1.35	865.22	
Grade "B" materials, 1,113.2 cu. yds. at $1.00	1,113.20	
Grade "B" materials, truck measure, 412.0 cu. yds. at 90c	370.80	
Hauling materials, 8,607.1 yd. mi. at 18c	1,549.28	
Excess sand, 92.0 cu. yds. at 30c	27.60	
Sub-total, Arlington Section	$ 6,232.55	
Materials south of Arlington		
Broken stone resurfacing, 5,840.0 cu. yds. at $1.50	8,760.00	
Grade "A" materials, 1,969.5 cu. yds. at $1.35	2,658.82	
Grade "B" materials, 6,202.3 cu. yds. at $1.00	6,202.30	
Grade "B" materials, truck measure, 835.5 cu. yds. at 90c	751.95	
Hauling resurfacing materials, 13,925.0 yd. mi. at 18c	2,506.50	
Hauling maintenance materials, 16,099.5 yd. mi. at 18c	2,897.91	
Excess sand, 416.5 cu. yds. at 30c	124.95	
Force account items:		
Building fences around stock piles	26.87	
Sub-total, Arlington-Shutler Creek Section	$23,929.30	
Total amount paid to contractor		30,161.85
Grand total cost of project, all state funds, 1927-28		$33,446.49

GRANT COUNTY

There are two state highways in Grant County, the John Day Highway which traverses the county practically through the middle from east to west and follows closely the John Day River through the John Day Valley, this highway being completed to state standards during previous years; and the Pendleton-John Day Highway which traverses the county in a north and south direction practically through the middle of the county from the north boundary to the John Day Highway, of which approximately 18.3 miles from Long Creek to a point south of Beech Creek has been constructed by the U. S. Forest Service. A survey has been completed by state forces from the south end of the section constructed by the Forest Service to the town of John Day. On the north portion of the Pendleton-John Day Highway from the Umatilla County line to Long Creek some reconnaissance work has been done by state forces.

Supervision of work in Grant County east of Dayville is under the direction of H. G. Smith, Division Engineer, with headquarters at La Grande, Oregon. Supervision of work west of Dayville has been handled by C. W. Wanzer, Division Engineer, with headquarters at Bend.

Fox Section Forest Road Project

This project is one which was carried over from the previous biennium, and a descriptive article will be found on page 326 of the last report.

Under the original contract awarded, grading was begun in the early summer of 1926, and was completed in the summer of 1928. Under the Bureau's contract, the project was to have been constructed on the stage construction idea, starting with the Bureau's eight-foot standard. By separate arrangement between the contractor and Grant County, this was later revised to the Bureau's 14-foot standard, with the county paying for the extra width. The surfacing of the project was carried out to the Bureau's eight-foot standard.

The total estimated cost of the work is $108,000, of which the county is to pay $54,000 and the federal government a like amount. The expenditures to date amount to $96,873.26, consisting of $54,000 of county funds and $42,873.26 from government funds.

Beech Creek Forest Road Project

This project begins at the south end of the Fox section at the head of Beech Creek and extends southerly for 4.1 miles along Beech Creek. For the most part, the work covered the widening of an old county grade, although numerous revisions were made in alignment.

The work was handled under the supervision of the Bureau of Public Roads, being graded and surfaced under separate contracts. J. A. Terteling and Sons of Moscow, Idaho, were the successful bidders in each instance. Construction was started in the fall of 1927 and was completed early in the summer of 1928.

The final estimated cost of the work is $42,000, of which the State is to cooperate to the extent of $20,000 and the Federal Government is to pay the balance of $22,000. Expenditures to date amount to $40,541.19, consisting of $20,000 from State funds and $20,541.19 from Government funds.

[GRANT]

Prairie City-Unity Forest Road Project

This project was completed during the previous biennium and a descriptive article will be found on page 305 of the last report.

The only entries during the present biennium cover a refund of $16,-764.66 received by the department as reimbursement for prior excess expenditures. The final total cost of the project has amounted to $614,192.20, of which $146,985.34 has been expended from state funds, $160,110.76 from county funds and $307,096.10 from government funds.

Maintenance

East of Dayville the maintenance work is under the supervision of the La Grande division. The maintenance consists of maintaining macadam surfacing of which there are 71.14 miles. W. C. Ford is patrolman in charge of the section from Dayville to Cole's Bridge. The section from Cole's Bridge to Dad's Creek east of Prairie City was in charge of Dan J. Gleason and D. F. Dimmick, successively. The section from Dad's Creek to the Baker County line is in charge of Chas. W. Powell, patrolman, with headquarters near Austin. J. N. Bishop is Resident Maintenance Engineer in charge with headquarters at Baker. General supervision is under the direction of H. G. Smith, Division Engineer, with headquarters at La Grande.

West of Dayville the maintenance of the John Day Highway has been done by state maintenance patrol forces and equipment. This section is constructed of broken stone macadam and requires the usual equipment for this character of surfacing.

The cost of maintenance of the roadbed on this section is often times high due to many cloudbursts and waterspouts which are prevalent here.

The minor betterment work consisted of the widening of cuts and fills and improving sight distances on curves.

The work on this section of the John Day Highway is handled by Resident Maintenance Engineer J. R. Mitchell, located at Condon.

Patrol Station near Austin

On the John Day Highway, at the junction of the John Day Highway with the spur road to Austin.

When the Forest Section of the John Day Highway in Grant County was turned over to the State Highway Commission to maihtain, it became necessary to establish a patrol headquarters near Austin. A tract of land was leased from the United States Forest Service and living quarters for the patrol crew, equipment sheds and other facilities were constructed. The living quarters or houses were built and paid for by the patrolman and his assistant. The equipment shed and other facilities were paid for with state funds. Mr. J. N. Bishop is Resident Maintenance Engineer in charge. Mr. Chas. W. Powell is the patrolman who makes this location his headquarters.

[GRANT]

Beech Creek-John Day Surveys

This survey was made in two units. The North Unit is from the Forest boundary to the forks of Beech Creek, a distance of approximately six miles. The South Unit is from the forks of Beech Creek to John Day on the John Day Highway and crosses over a divide directly into John Day instead of following Beech Creek to Mt. Vernon, thereby saving a distance of approximately seven miles. The survey completes the south end of the Pendleton-John Day Highway and when other units to the north are surveyed and constructed will afford a direct route from Pendleton to Burns and eventually to the California and Nevada lines.

Dale-Long Creek Reconnaissance

Preliminary investigations were started by Mr. W. C. Williams to determine the most feasible route from Camas Creek to Dale and Long Creek. Mr. Williams was transferred to other work and the investigation was not completed. The preliminary investigation indicates that the route via Range is approximately 26.4 miles, with a summit elevation of 4,060 feet, and the route via Ritter is approximately 34.5 miles with a summit elevation of 4,650 feet. Considerable investigation remains to be done covering the country between the routes mentioned in order to secure the most favorable crossing of the middle fork of the John Day River.

HARNEY COUNTY

The Central Oregon Highway which extends from Bend on The Dalles-California Highway, to Cairo on the Old Oregon Trail, crosses Harney County from east to west in the north half of the county, passing through Burns. There is also a short section of highway extending from Burns through Lawen to Crane, the former railhead in Harney County.

During the past biennium, 3.43 miles of grading on the Central Oregon Highway have been practically completed. This short section comprises all the construction undertaken in this county on the highway system during the biennium. Surveys and investigations have been made at several points east of Burns, and in the near future it is likely that some construction will be started on the Central Oregon Highway. All work in this county is under the direction of H. G. Smith, Division Engineer, with headquarters at La Grande, Oregon.

Buchanan-Nigger Flat Grading

On the Central Oregon Highway, from a point approximately 24 miles east of Burns to a point approximately 27.4 miles east of Burns; 3.43 miles of roadbed grading.

Contract No. 997, awarded September 27, 1927, to Jetley Brothers, of Burns, Oregon. Work commenced October 18, 1927. Estimated cost, $47,000, being $25,000 from state funds and $22,000 from county funds. Expenditures to date, $40,061.36, consisting of $21,439.15 from state funds and $18,622.21 from county funds. Resident Engineers, W. C. Williams and E. B. Loken.

This section was let as a part of a contract covering 3.43 miles of grading on the Central Oregon Highway and 7.74 miles on the Burns-Otis Creek Market Road, combining the two units creating a section large enough to secure reasonable construction prices.

Maintenance

At the close of the 1927-1928 biennium there are 44.86 miles of state highway under maintenance in Harney County, of which 32.4 miles are macadam and 12.46 miles are graded road.

The maintenance work has been in charge of Roy McGee, patrolman, with headquarters at Burns. J. N. Bishop, with headquarters at Baker, is Resident Maintenance Engineer. General supervision is under the direction of H. G. Smith, Division Engineer.

Buchanan Ranch-Vanderveer Survey

Owing to lack of funds it was not possible to build the state highway from the Malheur Valley to the Harney Valley, so a survey was made, using a part of the Central Oregon Highway from Buchanan Ranch to Nigger Flat and a portion of the Burns-Otis Valley Market Road from Nigger Flat to Vanderveer's Ranch, thus affording a through route from Burns to Drewsey which can be used until such time as funds are available for the Central Oregon Highway.

HOOD RIVER COUNTY

The activities in Hood River County during this biennium have been confined entirely to maintenance and betterments, all state highways within the county having been graded and surfaced prior to this time.

The Columbia River Highway throughout the county, being paved with asphalt surface, has been kept in repair by state forces and portable paving plant. Curves were widened where practicable and guard fences repaired where necessary.

The Mt. Hood Highway in Hood River County has been oiled its entire length, various types having been used as conditions warranted. On that portion of the Mt. Hood Highway adjacent to Mt. Hood considerable difficulty was experienced with flood conditions due to the fact that the melting snows on the sand slopes of the mountain cause the natural drainage courses to become blocked and then forced out on entirely new channels, which upon reaching the highway have caused portions of the roadbed to become covered with debris and also to be washed away in sections.

Snow conditions on the portion of the Mt. Hood Highway within the limits of the National Forest are so severe in the winter months that it has not been deemed advisable to keep it open to traffic. However, that portion north of the north forest boundary has been kept open at all times by the use of motorized equipment.

On the Columbia River Highway the worst snow conditions since the big storm of 1921 were encountered during the winter of 1927-1928. The highway between Hood River and Crown Point became completely blocked, the snow banks reaching tremendous depths for long sections. It was necessary to bring in additional heavy equipment, consisting of rotary plows, etc., from other sections of the state. After considerable time this section of the highway was opened to traffic, and work then proceeded on into Multnomah County where the equipment was turned over to officials of that county for use in opening the highway there.

At Viento Park a suitable comfort station was constructed and a drinking fountain provided, the water supply being from a spring adjacent.

All state highway work in the county during the biennium has been handled under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend.

Maintenance

Maintenance work on the Columbia River Highway has consisted primarily of the routine of removing slides, sanding pavement, cleaning drainage, removing snow, etc. The snow conditions were such the past biennium that heavy duty equipment, rotary plows, etc., were necessary to open the roadway after severe storms. It was also necessary to patch and repair the bituminous pavement between the Multnomah and Wasco County lines. The work has been done by state forces and equipment.

The Mt. Hood Highway has required very extensive maintenance, especially that portion within the National Forest. Traffic is very heavy on this highway during the summer months. During the fall and spring months considerable difficulty has been experienced with slides and flood

[HOOD RIVER]

conditions. Subsequent to the primary oiling of the Mt. Hood Highway in 1926, which was done at that time mostly as a dust preventative, certain sections have been reoiled, using different types as conditions warranted to keep it in repair.

Contracts have been awarded for getting out suitable materials for use in the maintenance of the oiled roadway.

Work within the county is handled by K. D. Lytle, Resident Maintenance Engineer, located at The Dalles.

Parkdale Maintenance Materials

On the Mt. Hood Highway, in the vicinity of Parkdale.

Contract No. 960, awarded March 29, 1927, to Doggett & Cooper, of Parkdale, Oregon. Work commenced May 20, 1927; completed September 16, 1927. Final cost, $30,351.95. Resident Engineer, K. D. Lytle.

This work consisted of the furnishing of broken stone maintenance materials for use in connection with maintenance operations on the Parkdale Section of the Mt. Hood Loop Highway. The quarry was located approximately two miles south of Parkdale and one and five-tenths miles west of the highway, at what is known as the Old County quarry. The major portion of the materials were stock-piled at points designated by this department, the balance having been delivered into state trucks at the bunkers.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 885.05
Contract items as follows:		
Grade "A" broken stone in stock pile, 1,890.8 cu. yds. at $2.00	$ 3,781.60	
Grade "B" broken stone in stock pile, 1,666.4 cu. yds. at $1.90	3,166.16	
Grade "C" broken stone in stock pile, 3,344.2 cu. yds. at $1.90	6,353.98	
Grade "D" broken stone in stock pile, 1,768.8 cu. yds. at $1.80	3,183.84	
Grade "A" broken stone in trucks, 302.5 cu. yds. at $1.95	589.88	
Grade "B" broken stone in trucks, 447.0 cu. yds. at $1.80	804.60	
Grade "C" broken stone in trucks, 672.5 cu. yds. at $1.80	1,210.50	
Grade "D" broken stone in trucks, 16.0 cu. yds. at $1.70	27.20	
Hauling broken stone in stock piles, 44,180.7 yd. mi. at 20c	8,836.14	
Hauling broken stone to road, 6,680.0 yd. mi. at 18c	1,202.40	
Clearing stock pile sites (force account work)	310.60	
Total amount paid to contractor		29,466.90
Grand total cost of project, all state funds, 1927-28		$ 30,351.95

Barlow Pass-North Forest Boundary Maintenance Materials

On the Mt. Hood Highway, from Barlow Pass to the north Forest Boundary.

Contract No. 990, awarded July 28, 1927, to H. G. Johnson, of Alsea, Oregon. Work commenced October 13, 1927; completed June 26, 1927. Final cost, $23,270.03. Resident Engineer, A. A. Kirkwood.

This work consisted of the furnishing of broken stone maintenance materials for use by the state in connection with maintenance operations on the Barlow Pass-North Forest Boundary section of the Mt. Hood Loop Highway in Hood River County. The major portion of the materials were stock-piled at points designated by the department, the balance having been delivered into state trucks.

[HOOD RIVER]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,416.00
Prospecting for surfacing materials		675.32
Preparing stock pile sites		1,039.47
Credit for materials stock piled for betterment work		Cr 11,645.42
Contract items as follows:		
Grade "A" broken stone in stock pile, 4,128.4 cu. yds. at $1.80	$ 7,431.12	
Grade "B" broken stone in stock pile, 5,128.1 cu. yds. at $1.75	8,974.18	
Grade "D" broken stone in stock pile, 2,657.7 cu. yds. at $1.50	3,986.55	
Extra grade "D" broken stone in stock pile, 1,159.6 cu. yds. at 50c	579.80	
Grade "A" broken stone in trucks, 957.5 cu. yds. at $1.60	1,532.00	
Grade "B" broken stone in trucks, 62.5 cu. yds. at $1.60	100.00	
Grade "D" broken stone in trucks, 90.0 cu. yds. at $1.50	135.00	
Haul on road, 4,423.7 yd. mi. at 18c	796.27	
Stock pile haul, 41,027.8 yd. mi. at 20c	8,205.56	
Force account item:		
Clearing and grubbing stock pile site	44.18	
Total amount paid to contractor		31,784.66
Grand total cost of project, all state funds, 1927-28		$ 23,270.03

DETAIL OF BETTERMENT ITEMS TRANSFERRED

Grade "A" broken stone, 1,240.0 cu. yds. at $1.80	$ 2,232.00
Grade "B" broken stone, 1,254.0 cu. yds. at $1.75	2,194.50
Grade "D" broken stone, 2,350.0 cu. yds. at $1.50	3,525.00
Grade "D" broken stone, 800.0 cu. yds. at 50c	400.00
Hauling broken stone, 16,469.6 yd. mi. at 20c	3,293.92
Total	$ 11,645.42

Viento Park Comfort Station

On the Columbia River Highway, at Viento Park; one 22 by 14-foot framed comfort station.

Contract No. 977, awarded May 24, 1927, to Kelly & Fason, of The Dalles, Oregon. Work commenced June 6, 1927; completed April 12, 1928. Final cost, $3,823.73. Resident Engineer, K. D. Lytle.

The contractor defaulted on his contract and the job was completed by the bonding company.

JACKSON COUNTY

With the exception of the completion of the grading and surfacing of the approaches to the Rogue River Bridge at Gold Hill, no work of this nature has been under way in Jackson County during the past biennium.

On the Crater Lake Highway a bituminous macadam surface has been laid between Medford and Prospect and the section between Prospect and the Crater Lake National Park was given a light oil surface. This work was all done during the summer of 1928.

Work in the county has been handled under the supervision of W. E. Chandler, Division Engineer, with headquarters at Grants Pass.

Silver Creek-Park Boundary, Forest Road Surfacing

The work was underaken during the previous biennium and a descriptive article will be found on page 313 of the last report.

During the present biennium the Bureau of Public Roads has completed the work at an additional expenditure of $14,040.10. This brings the total cost of the work to $53,439.30, paid entirely from government funds.

Pacific Highway-Keene Creek Resurfacing

On the Ashland-Klamath Falls Highway, from the junction of the Ashland-Klamath Falls Highway with the Pacific Highway, which junction is approximately 7.1 miles south of Ashland, east to a point approximately 0.4 miles east of the crossing of Keene Creek; 11 miles of resurfacing and the furnishing of maintenance materials in stock piles.

Contract No. 924, awarded September 28, 1926, to C. L. Camp, of Spokane, Washington. Work commenced October 18, 1926; completed June 16, 1927. Final cost, $24,304.96. Resident Engineer, Jas. G. Bromley.

Due to a very rough condition caused by wear on surfacing materials, new materials were required to cover up sub-base stone and prepare the road for a treatment of oil.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,154.94
Royalty on surfacing		200.00
Processing materials and constructing surfacing		1,960.12
Procuring and preparing stock pile sites		105.30
Contract items as follows:		
Base course materials, 3,345.0 cu. yds. at $1.10	$ 3,679.50	
Top course materials, 2,844.0 cu. yds. at $1.25	3,555.00	
Base course maintenance, 956.0 cu. yds. at $1.10	1,051.60	
Top course maintenance, 3,500.0 cu. yds. at $1.35	4,725.00	
Hauling broken stone, 38,335.0 yd. mi. at 20c	7,667.00	
Hauling broken stone dust, 826.0 yd. mi. at 25c	206.50	
Total amount paid to contractor		20,884.60
Grand total cost of project, all state funds		$ 24,304.96

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 226.30
Expended 1927-28 biennium	24,078.66
Total of expenditures	$24,304.96

[JACKSON]

Siskiyou Quarry Maintenance Materials

On the Pacific Highway, at Siskiyou Summit quarry, which is situated approximately one-half mile west of the Pacific Highway at about Mile Post 340.5, which Mile Post is about 16 miles south of Ashland; furnishing of maintenance materials for shoulders and sanding pavement.

Contract No. 881, awarded May 25, 1926, to A. D. Kern, of Portland, Oregon. Work commenced June 14, 1926; completed November 1, 1926. Final cost, $19,344.75. Resident Engineer, Jas. G. Bromley.

Further details will be found on page 314 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 490.12
Purchase of Siskiyou Summit quarry		300.00
Purchase of extra right-of-way		21.30
Contract items as follows:		
Broken stone in bunkers, 2,880.2 cu. yds. at $2.06	$ 5,933.21	
Broken stone in stock piles, 5,122.0 cu. yds. at $2.46	12,600.12	
Total amount paid to the contractor		18,533.33
Grand total expended, all state funds		$19,344.75

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$16,584.75
Expended 1927-28 biennium	2,760.00
Total of expenditures	$19,344.75

Footes Creek Bridge

On the Pacific Highway, near Gold Hill; one 16-foot, one 44-foot and one 16-foot concrete spans continuous over all supports.

Contract No. 1,027, awarded December 20, 1927, to C. A. Catching, of Roseburg, Oregon. Work commenced January 10, 1928; completed June 15, 1928. Final cost $9,263.90. Resident Engineer, C. A. Jordan.

This bridge replaces a narrow steel span that has been supported by timber bents for several years. The alignment of the new structure does away with two bad curves which have been the scene of several bad wrecks.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$1,153.43
Name plates furnished by the state		15.64
Contract items as follows:		
Excavation, 339.5 cu. yds. at $2.00	$ 679.00	
Class "A" concrete, 142.99 cu. yds. at $22.00	3,145.78	
Class "D" concrete, 64,35 cu. yds. at $22.00	1,415.70	
Metal reinforcement, 37,686.5 lbs. at 4½c	1,695.89	
Concrete handrail, 163.0 lin. ft. at $4.50	733.50	
Removal of old bridge and maintenace of traffic	400.00	
Force account items:		
Extra cost of raising grade at bent No. 3	24.96	
Total amount paid to contractor		8,094.83
Grand total cost of structure, all state funds, 1927-28		$9,263.90

[JACKSON]

Gold Hill Section Surfacing and Maintenance Materials

Federal Aid Project No. 131

On the Pacific Highway, from Sta. 482+64.1, which station is about 1,400 feet east of the east end of the bridge, to Sta. 504+18.4, which station is about 300 feet west of the west end of the bridge in the town of Gold Hill, excepting that portion between Sta. 496+67.5 and Sta. 501+15.5, which includes the new bridge; 0.32 mile of surfacing.

Contract No. 970, awarded April 19, 1927, to C. L. Camp, of Ashland, Oregon. Work commenced July 10, 1927; completed September 15, 1927. Final cost $10,732.74. Resident Engineer, Jas. G. Bromley.

Material for this surfacing was obtained from a pit in Rogue River adjacent to the project. The gravel is of excellent quality.

The cost statement below includes, in addition to the surfacing, the cost of maintenance materials furnished under the contract.

DETAILED STATEMENT OF EXPENDITURES

Rogue River Bridge Approaches Surfacing		
Engineering		$ 192.39
Lease of stock pile site		50.00
Sprinkling surfacing materials		91.08
Contract items as follows:		
Sub-base course surfacing, 464.0 cu. yds. at $1.80	$ 835.20	
Base course surfacing, 444.0 cu. yds. at $1.90	843.60	
Top course surfacing, 256.0 cu. yds. at $2.00	512.00	
Earth filler, 360.0 cu. yds. at 50c	180.00	
Filler haul, 720.0 yd. mi. at 20c	144.00	
Total paid to contractor for surfacing		2,514.80
Sub-total (cost of surfacing)		$ 2,848.27
Gold Hill Section Maintenance Materials		
Engineering		$ 441.90
Extra cost of constructing permanent bunkers		15.68
Hauling ¾-inch materials		76.65
Contract items as follows:		
¾-inch materials in trucks, 325.0 cu. yds. at $1.32	$ 429.00	
½-inch materials in stock pile, 201.9 cu. yds. at $1.90	383.61	
Base course materials, 2,444.3 cu. yds. at $1.20	2,933.16	
Top course materials, 888.7 cu. yds. at $1.40	1,244.18	
Material haul, 11,625.15 yd. mi. at 20c	2,325.03	
Force account item:		
Clearing stock pile sites	35.26	
Total paid to contractor for maintenance materials		7,350.24
Sub-total (cost of maintenance materials)		7,884.47
Grand total cost of project, 1927-28		$ 10,732.74

PARTICIPATION IN COST

State	$ 9,010.74
Government	1,722.00
Total	$10,732.74

Gold Hill Maintenance Materials

Federal Aid Project No. 131

On the Pacific Highway, from Mile Post 286 to Mile Post 303.6; about 17.6 miles of maintenance materials.

Contract No. 970, awarded April 19, 1927, to C. L. Camp, of Ashland, Oregon. Work commenced July 10, 1927; completed September 15, 1927. Final cost, $7,884.47. Resident Engineer, Jas. G. Bromley.

[JACKSON]

The contract for the maintenance materials was let, along with the contract for surfacing the Gold Hill Bridge approaches. The maintenance materials were piled along the Pacific Highway to be used in pavement patching and shoulder maintenance.

A cost statement for this work will be found under the article in this report covering the surfacing of the Gold Hill Bridge approaches.

Medford-Prospect Resurfacing

On the Crater Lake Highway, from Mile Post 0.6, at the city limits of Medford, north to Mile Post 9.0; 8.4 miles of resurfacing and the placing of maintenance materials in stock pile for the section from Medford to Prospect, approximately 45 miles in length.

Contract No. 962, awarded March 29, 1927, to John Hampshire, of Grants Pass, Oregon. Work commenced May 15, 1927; completed April 8, 1928. Final cost, $39,609.50. Resident Engineer, Jas. G. Bromley.

As this is one of the main highways leading to the Crater Lake National Park, a smooth-riding and dustless surface is highly desired. These materials were used to patch up old surfacing and stock pile material for oiling or oil macadam.

Detailed Statement of Expenditures

Engineering		$ 3,766.59
Labor and materials furnished by the state:		
Royalties paid for surfacing materials		1,184.95
Purchase and lease of stock pile sites		211.60
Hauling and processing surfacing materials		3,322.32
Furnishing, hauling and spreading filler		4,758.57
Sprinkling surfacing materials		2,839.39
Preparing stock pile sites		42.48
Warning signs for control of traffic		38.70
Materials stock piled for betterment work		Cr. 43,425.92
Contract items as follows:		
Grade "A" materials in stock piles, 1,465.0 cu. yds. at $1.97	$13,110.35	
Grade "B" materials in stock piles, 5,732.5 cu. yds. at $1.82	10,433.15	
Grade "C" materials in stock piles, 2,254.7 cu. yds. at $1.82	4,103.55	
Grade "D" materials in stock piles, 14,252.2 cu. yds. at $1.62	23,088.56	
Grade "E" materials in stock piles, 906.3 cu. yds. at $1.77	1,604.15	
Grade "A" materials in trucks 259.0 cu. yds. at $1.30	336.70	
Grade "B" materials in trucks, 347.5 cu. yds. at $1.15	399.63	
Grade "D" materials in trucks, 2,188.0 cu. yds. at 95c	2,078.60	
Grade "E" materials in trucks, 2,271.0 cu. yds. at $1.10	2,498.10	
Grade "AB" materials in trucks, 514.5 cu.yds. at $1.225	630.26	
Truck haul, 13,277.25 yd. mi. at 18c	2,389.91	
Extra haul, stock pile measure, 23,493.7 yd. mi. at 22c	5,168.61	
Force account items:		
Preparation of stock pile sites	776.19	
Grading Rogue River gravel pit after removal of materials	253.06	
Total amount paid to contractor		66,870.82
Grand total cost of project, all state funds, 1927-28		$39,609.50

DETAIL OF BETTERMENT ITEMS TRANSFERRED

Grade "A" crushed gravel, 4,949.0 cu. yds. at $1.97	$ 9,749.53
Grade "B" crushed gravel, 4,928.0 cu. yds. at $1.82	8,968.96
Grade "C" crushed gravel, 1,407.0 cu. yds. at $1.82	2,560.74
Grade "D" crushed gravel, 10,184.0 cu. yds. at $1.62	16,498.08
Grade "E" crushed gravel, 493.0 cu. yds. at $1.77	872.61
Grade "A" crushed rock, 530.0 cu. yds. at $2.40	1,272.00
Grade "B" crushed rock, 695.0 cu. yds. at $2.40	1,668.00
Grade "C" crushed rock, 816.0 cu. yds. at $2.25	1,836.00
	$43,425.92

[JACKSON]

Prospect-Park Boundary Maintenance Materials

On the Crater Lake Highway, from a point three miles south of Prospect to the Crater Lake Park Boundary.

Contract No. 993, awarded August 30, 1927, to C. L. Camp, of Gold Hill, Oregon. Work commenced October 15, 1927. Estimated cost, $23,000, from state funds; expenditures to date, $11,351.78. Resident Engineer, C. H. Armstrong.

Gold Hill Bridge Approaches Grading

Federal Aid Project No. 131

On the Pacific Highway, from Sta. 482+64.1, which station is approximately 1,400 feet east of the east end of the bridge, to Sta. 504+18.4, which station is about 300 feet west of the west end of the bridge in the town of Gold Hill, excepting that portion between Sta. 496+67.5 and Sta. 501+15.5, which includes the bridge; 0.32 mile of grading.

Contract No. 961, awarded March 29, 1927, to C. Frank Rhodes, of Medford, Oregon. Work commenced May 25, 1927; completed September 15, 1927. Final cost, $14,660.41. Resident Engineer, Jas. G. Bromley.

This grading project was a rough section and eliminated one grade crossing and one underhead crossing.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 747.43
Signs and watchman for traffic control		8.50
Contract items as follows:		
Clearing and grubbing, all	$ 100.00	
Excavation, single classification, 16,005.0 cu. yds. at 40c	6,402.00	
Overhaul, 79,725.0 yd. sta. at 3c	2,391.75	
24-inch concrete pipe, 63.0 lin. ft. at $4.00	252.00	
Class "A" concrete, 45.0 cu. yds. at $25.00	1,125.00	
Metal reinforcement, 6,950.0 lbs. at 6c	417.00	
Riprap, 1,071.9 cu. yds. at $2.25	2,411.78	
Force account items:		
Constructing 6-inch tile drain where required	772.02	
Removing and storing old pavement for future use	32.93	
Total amount paid to contractor		13,904.48
Grand total cost of project, 1927-28		$ 14,660.41

PARTICIPATION IN COST

State	$ 253.16
County	6,952.24
Government	7,455.01
Total	$14,660.41

Rogue River Bridge at Gold Hill

Federal Aid Project No. 131

On the Pacific Highway, at Gold Hill; one 143-foot concrete arch with four 50-foot and two 53-foot concrete beam spans.

Contract No. 918, awarded August 26, 1926, to O. N. Pierce Company, of Portland, Oregon. Work commenced September 13, 1926; completed June 10, 1927. Final cost, $55,520.12. Resident Engineer Marshall Dresser.

[JACKSON]

This bridge eliminates a grade crossing and an undercrossing of the Southern Pacific Railway and replaces a light steel truss. To guard against danger from high water, the arch was constructed as one single wide rib, greatly stiffening the structure laterally.

Further details will be found on page 314 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,521.09
Materials furnished by the state:		
Conduit for light wires		60.30
Name plates for bridge		26.72
Contract items as follows:		
Excavation to plan elevation, 246.72 cu. yds. at $3.00	$ 740.16	
Excavation below plan elevation, 67.15 cu. yds. at $5.00	335.75	
Class "A" concrete, 1,141.5 cu. yds. at $25.00	28,537.50	
Class "D" concrete, 313.75 cu. yds. at $23.00	7,216.25	
Metal reinforcement, 225,840.0 lbs. at 5c	11,292.00	
Concrete handrail, 910.0 lin. ft. at $4.00	3,640.00	
Force account items:		
Placing conduit for light wires	27.76	
Furnishing "con-tex" for special surface treatment	165.52	
Total amount earned by contactor	$51,954.94	
Deduction for cement shortage	42.93	
Total amount paid to contractor		51,912.01
Grand total cost of structure		$ 55,520.12

PARTICIPATION IN COST

	State	*County*	*S. P. Co.*	*Government*	*Total*
Expended 1925-26 biennium	$ 4,141.20	$	$	$	$ 4,141.20
Expended 1927-28 biennium	Cr. 2,196.77	20,706.01	10,500.00	22,369.68	51,378.92
Total of expenditures	$ 1,944.43	$20,706.01	$10,500.00	$22,369.68	$ 55,520.12

Gold Hill-Medford Survey

This survey began at the north city limits and extended north to Mile Post 300.6, near the summit of Blackwell Hill and about 3.6 miles south of Gold Hill. It was undertaken in order to make a study of the possibility of eliminating many of the right angle turns which exist in the present highway.

The net length of survey made was 9.33 miles. This consisted of a preliminary line which was run by C. H. Armstrong, Resident Engineer.

JEFFERSON COUNTY

All state contracts for construction of highways within this county have been completed. The Dalles-California Highway, which has a macadam surface, has been oiled with heavy oil, making a very excellent roadway.

There have been several contracts awarded for furnishing suitable materials for use in the maintenance and oiling operations, all of which are completed at this time.

The completion of the improvements of Ogden Park, located at the crossing of Crooked River, now makes this place one of the most picturesque in the country.

All state work within the county has been handled by C. W. Wanzer, Division Engineer, with headquarters at Bend.

Crooked River Surfacing

On The Dalles-California Highway, from Sta. 0+00, 1.5 miles north of the town of Terrebonne, and extending north to Sta. 240+00, approximately six miles south of Culver, being partly in Jefferson and partly in Deschutes county; 4.55 miles of broken stone surfacing 18 feet wide and eight inches in thickness, being of the "trench" type of cross-section.

Contract No. 867, awarded February 25, 1926, to Kibbler & Bartlett, of Albany, Oregon. Work commenced July 13, 1926; completed November 6, 1926. Final cost, $30,414.32. Resident Engineer, W. S. Hodge.

Further details will be found on page 279 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 978.84
Materials furnished by the state:		
Sprinkling surfacing materials		2,850.06
Royalty paid for surfacing materials		86.00
Rental of state equipment used by contractor		129.66
Contract items as follows:		
Within Deschutes County		
Base course surfacing, 1,723.5 cu. yds. at $2.20	$ 3,791.70	
Top course surfacing, 1,609.0 cu. yds. at $2.20	3,539.80	
Maintenance materials, 308.7 cu. yds. at $2.00	617.40	
Earth filler, 1,074.0 cu. yds. at 40c	429.60	
Filler payhaul, 2,258.0 yd. mi. at 20c	451.60	
Sub-total in Deschutes county	$ 8,830.10	
Within Jefferson County		
Base course surfacing, 3,479.0 cu. yds. at $2.20	$ 7,653.80	
Top course surfacing, 3,013.0 cu. yds. at $2.20	6,628.60	
Maintenance materials, 972.18 cu. yds. at $2.00	1,944.36	
Earth filler, 2,185.4 cu. yds. at 40c	874.16	
Filler payhaul, 2,842.0 yd. mi. at 20c	568.40	
Sub-total in Jefferson county	$17,669.32	
Deduction for rental of state-owned equipment	129.66	
Total amount paid to contractor		26,369.76
Grand total cost of project		$ 30,414.32

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$21,402.48	$	$ 21,402.48
Expended 1927-28 biennium	8,129.68	882.16	9,011.84
Total expended to date	$29,532.16	$ 882.16	$ 30,414.32
Estimated balance to complete	Cr. 9,000.00	9,000.00	
Estimated total cost	$20,532.16	$ 9,882.16	$ 30,414.32

[JEFFERSON]

Crooked River Grading

On The Dalles-California Highway, from Sta. 0+00, approximately one and one-half miles north of the town of Terrebonne, to Sta. 240, approximately six miles south of the town of Culver, being 1.33 miles in Deschutes County and 3.22 miles in Jefferson County; 4.55 miles of grading, consisting of general grading work except that portion at the Crooked River Bridge which consisted of backfilling against the bridge abutments.

Contract No. 852, awarded September 29, 1925, to Logan Brothers, of Arlington, Oregon. Work commenced October 19, 1925; completed August 31, 1926. Final cost, $13,925.89. Resident Engineer, W. S. Hodge.

Further details will be found on page 285 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering			$ 2,546.67
Item deducted from the contractor's estimate:			
12-inch concrete pipe furnished by the state			8.80
Contract items as follows:			
Within Deschutes County			
Clearing and grubbing, all		90.00	
Common excavation, 8,717.7 cu. yds. at 24c		2,092.25	
Intermediate excavation, 1,188.9 cu. yds. at 50c		594.45	
Solid rock excavation, 972.3 cu. yds. at $1.30		1,263.99	
Overhaul, 1,180 yd. sta. at 4c		47.20	
12-inch plain concrete pipe, 228.0 lin. ft. at $1.20		273.60	
Force account items:			
Rebuilding 250 feet of wood flume		52.04	
Excavating rock without explosives at south end of Crooked River bridge		388.21	
Sub-total in Deschutes county		$ 4,801.74	
Within Jefferson County			
Clearing and grubbing, all		$ 210.00	
Common excavation, 15,473.6 cu. yds. at 24c		3,713.66	
Intermediate excavation, 2,499.7 cu. yds. at 50c		1,249.85	
Solid rock excavation, 784.9 cu. yds. at $1.30		1,020.37	
Overhaul, 4,190.0 yd. sta. at 4c		167.60	
12-inch plain concrete pipe, 180.0 lin. ft. at $1.20		216.00	
Sub-total in Jefferson county		$ 6,577.48	
Total amount earned by contractor		$11,379.22	
Deduction for pipe furnished by state		8.80	
Total amount paid to contractor			11,370.42
Grand total cost of project			$ 13,925.89

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$13,523.71	$	$ 13,523.71
Expended 1927-28 biennium	Cr. 4,399.56	4,801.74	402.18
Total of expenditures	$ 9,124.15	$ 4,801.74	$ 13,925.89

Metolius Cut-off Grading

On The Dalles-California Highway, from Sta. 878+00, which station is at the north end of Jefferson street in Metolius, to Sta. 929+50, which station is on the existing highway at a point about one mile north of Metolius; 0.98 mile of grading, consisting of general grading work to standard section.

[JEFFERSON]

Contract No. 936, awarded January 27, 1928, to Wm. Endicott, of Madras, Oregon. Work commenced February 17, 1927; completed April 25, 1927. Final cost, $4,129.13. Resident Engineer, W. S. Hodge.

This work consisted of a major revision of the existing alignment of The Dalles-California Highway at this place, the same being a "short cut" across a subdivision, eliminating considerable distance and three sharp turns. It also eliminates the construction of a structure over the roadbed and right of way of the Oregon Trunk Railway Company, the then existing overcrossing being a timber structure which would have had to be rebuilt within a very short time.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 439.44
Contract items as follows:		
Common excavation, 6,032.8 cu. yds. at 24c	$ 1,447.87	
Intermediate excavation, 573.1 cu. yds. at 50c	286.55	
Solid rock excavation, 1,037.3 cu. yds. at $1.55	1,607.82	
Overhaul, 4,375.0 yd. sta. at 5c	218.75	
12-inch concrete pipe, 117.0 lin. ft. at $1.10	128.70	
Total amount paid to contractor		3,689.69
Grand total cost of project, all state funds, 1927-28		$ 4,129.13

Undercrossing of Oregon Trunk Railroad

On The Dalles-California Highway, at Crooked River; viaduct and retaining wall.

Contract No. 895, awarded June 24, 1926, to Wm. Endicott, of Madras, Oregon. Work commenced July 12, 1926; completed September 30, 1926. Final cost, $4,405.31. Resident Engineer, Christ Fauerso.

This project has been held open only to record payment of the final expenditures on the work.

Further details will be found on page 317 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 343.50
Riprapping work performed by state forces		75.21
Contract items as follows:		
Excavation for wall, 249.8 cu. yds at $1.00	$ 249.80	
Foundation excavation, 87.97 cu. yds. at $3.00	263.91	
Class "A" concrete, 19.33 cu. yds. at $20.00	386.60	
Class "B" concrete, 84.18 cu. yds. at $20.00	1,683.60	
Class "D" concrete, 22.02 cu. yds. at $22.00	484.44	
Metal reinforcement, 10,750.0 lbs. at 7c	752.50	
Cement adjustment, 18.5 bbls. at $2.70	68.45	
Force account items:		
Constructing masonry foundation for viaduct on cliff side	97.30	
Total amount earned by contractor		3,986.60
Grand total cost of structure		$ 4,405.31

PARTICIPATION IN COST

	State	*O.T.R.R.*	*Total*
Expended 1925-26 biennium	$ 3,817.02	$	$ 3,817.02
Expended 1927-28 biennium	Cr. 151.71	740.00	588.29
Total of expenditures	$ 3,665.31	$ 740.00	$ 4,405.31

[JEFFERSON]

Crooked River Bridge

On The Dalles-California Highway, near Terrebonne; steel and reinforced concrete spans.

Contract No. 840, awarded July 28, 1925, to Kuckenberg and Wittman, of Portland, Oregon. Work commenced August 12, 1925; completed September 19, 1926. Final cost, $140,434.60. Resident Engineer, Christ Fauerso.

This project has been carried into the present biennium only to make payment of the final expenditures on the project.

Further details will be found on page 317 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 8,795.19
Bronze name plates		129.70
Changing angle of pin in bridge bearing casting		376.40
Contract items as follows:		
Excavation, 5,595.0 cu. yds. at $1.75	$ 9,791.25	
Class "A" concrete, 345.37 cu. yds. at $30.00	10,361.10	
Class "D" concrete, 327.6 cu. yds. at $30.00	9,828.00	
Metal reinforcement, 109,427.0 lbs. at 6c	6,565.62	
Structural steel, 817,331.0 lbs. at 9½c	77,646.45	
Concrete handrail, 1,129.5 lin. ft. at $5.00	5,647.50	
Adjustment account of alterations in details of construction	2,798.81	
Force account items:		
Labor and materials for office shack	67.61	
Removing dangerous cliff on left of bridge	2,982.41	
Drilling anchor bolt holes	1,273.05	
Constructing rubble masonry on cliffs back of bridge seat to prevent erosion and slides	3,259.63	
Removing rivets in one end of floor stringers and lace bars and putting in oversize rivets and turned bolts	500.24	
Waterproofing joints in the north abutment	188.26	
Furnishing brass expansion plates	223.38	
Total amount paid to contractor		131,133.31
Grand total cost of project		$140,434.60

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$109,032.56	$20,000.00	$129,032.56
Expended 1927-28 biennium	Cr. 7,880.14	19,282.18	11,402.04
Total of expenditures	$101,152.42	$39,282.18	$140,434.60

Ogden Park Development

On The Dalles-California Highway, approximately 10 miles north of Redmond and immediately north of the Jefferson-Deschutes County line; 1,041 lineal feet of rock parapet wall and concrete viaduct.

Contract No. 915, awarded August 26, 1926, to Wm. Endicott, of Madras, Oregon. Work commenced September 20, 1926; completed June 10, 1927. Final cost, $8,261.81.

This contract consisted of constructing approximately 1,041 lineal feet of rock parapet wall along the edge of Crooked River Canyon, beginning at the south end of the Crooked River Bridge, and extending westerly along the edge of the canyon to a point west of the Oregon Trunk Railway Bridge. In order to get sufficient width of roadway at the under-

[JEFFERSON]

crossing of the railroad bridge, it was necessary to construct a short section of concrete overhanging half-viaduct. Owing to the late season, it was found advisable not to attempt some of the concrete work until the following spring due to the cold weather and frost which prevailed at this place.

Further details will be found on page 316 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 493.54
Labor and materials furnished by state:		
Purchase of park site		619.98
Bronze name plates		129.70
Signs and miscellaneous materials		41.39
Contract items as follows:		
Cement rubble masonry, 172.86 cu. yds. at $16.00	$2,765.76	
Rubble masonry for parapet walls, 1,040.9 cu. yds. at $2.40	2,498.16	
Class "A" concrete, 33.57 cu. yds at $35.00	1,174.95	
Metal reinforcement, 2,177.0 lbs. at 7½c	163.28	
Earth backfill, 611.9 cu. yds. at 55c	336.55	
8-inch concrete drain pipe, 77.0 lin. ft. at 50c	38.50	
Total amount paid to contractor		6,977.20
Grand total cost of project, all state funds		$8,261.81

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 583.57
Expended 1927-28 biennium	7,678.24
Total of expenditures	$8,261.81

Maintenance

The maintenance work in this county is confined entirely to 40.3 miles of The Dalles-California Highway, all of which has been surfaced with macadam and treated with heavy oil. It has been possible by the patrol maintenance crews to maintain a very smooth surface without excessive cost.

Contracts were awarded for the getting out and stock piling of suitable materials for use in the maintenance of the oiled surfacing, which contracts are now completed.

The work in this county was handled by Resident Maintenance Engineer W. S. Hodge, with headquarters at Redmond.

Madras-Opal City Maintenance Materials and Surfacing

On The Dalles-California Highway, from Madras to Opal City, and surfacing the Metolius cut-off which begins at the north limits of Metolius and extends one mile northerly; one mile of surfacing 18 feet wide, nine inches in thickness, loose measure, and furnishing maintenance materials.

Contract No. 998, awarded September 27, 1927, to L. F. Ireton, of McMinnville, Oregon. Work commenced October 31, 1927; completed May 7, 1928. Final cost, $38,392. Resident Engineer, W. S. Hodge.

The materials were secured from two sources, one at Madras and one approximately two miles south of Culver. Stock piles were made at convenient points along the section as designated by this department. The

surfacing of the Metolius cut-off was done in connection with this work and consists of a strip 18 feet wide and nine inches thick, loose measure, being one mile in length.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,378.66
Labor and equipment rental deducted from contractor's estimate		200.70
Labor and materials furnished by state:		
Lease of quarry site		50.00
Lease of stock pile sites		35.00
Preparing stock pile sites		58.11
Provisions for control of traffic		16.90
Contract items as follows:		
Grade "A" broken stone in stock pile, 4,730.4 cu. yds. at $2.29	$10,832.62	
Grade "B" broken stone in stock pile, 5,814.9 cu. yds. at $2.18	12,676.48	
Grade "C" broken stone in stock pile, 462.8 cu. yds. at $2.12	981.14	
Grade "A" broken stone in trucks, 4.0 cu. yds. at $2.23	8.92	
Grade "B" broken stone in trucks, 12.0 cu. yds. at $2.12	25.44	
Hauling broken stone, 20,501.0 yd. mi. at 20c	4,100.20	
Sub-base course surfacing, 1,196.0 cu. yds. at $2.65	3,169.40	
Base course surfacing, 876.0 cu. yds. at $2.90	2,540.40	
Top course surfacing, 696.0 cu. yds. at $3.00	2,088.00	
Earth filler, 885.0 cu. yds. at 40c	354.00	
Filler haul, 313.0 yd. mi. at 20c	62.60	
Force account items:		
Preparing stock pile sites	14.13	
Total amount earned by contractor	$36,853.33	
Deductions:		
Rental of state-owned equipment	96.60	
Work performed by state forces	104.10	
Total amount paid to contractor		36,652.63
Grand total cost of project, all state funds, 1927-28		$38,392.00

Cow Canyon-Madras Maintenance Materials

On The Dalles-California Highway, from the Wasco-Jefferson County line to Madras; maintenance materials of various quantities and sizes to be used in oiling operations.

Contract No. 937, awarded January 27, 1927, to Harness & Colby, of Roseburg, Oregon. Work commenced March 14, 1927; completed July 23, 1927. Final cost, $24,623.62. Resident Engineer, W. S. Hodge.

The materials were secured from two crusher set-ups, one in Cow Canyon and one approximately 10 miles north of Madras. Materials were placed in stock piles in quantities and at points designated by this department.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 903.13
Preparing stock pile sites		43.70
Royalty on surfacing materials		75.00
Contract items as follows:		
Grade "A" broken stone in stock piles, 2,273.2 cu. yds. at $1.90	$ 4,319.08	
Grade "B" broken stone in stock piles, 7,418.1 cu. yds. at $1.45	10,756.25	
Grade "C" broken stone in stock piles, 532.2 cu. yds. at $1.45	771.69	
Grade "A" broken stone in trucks, 400.0 cu. yds. at $1.80	720.00	
Grade "B" broken stone in trucks, 1,258.0 cu. yds. at $1.35	1,698.30	
Hauling broken stone, 25,848.0 yd. mi. at 20c	5,169.60	
Excess fine material, 136.2 cu. yds. at 5c	6.81	
Hauling excess fine material, 68.0 yd. mi. at 20c	13.60	
Force account items:		
Clearing and leveling stock pile sites	146.46	
Total amount paid to contractor		23,601.79
Grand total cost of project, all state funds, 1927-28		$ 24,623.62

JOSEPHINE COUNTY

During the past biennium there has been no new construction work on the Pacific Highway within the county as this had all been completed during prior years. There have been, however, surveys made of some proposed changes in location which will come up for future consideration. None of these proposed changes are very major in their nature but involve only minor revision in the existing location.

The Redwood Highway now has been completely constructed from the California line to Grants Pass. With the exception of seven miles, the highway now is oiled throughout its entire length. The section of seven miles now unoiled is on the program for oiling during 1929.

On the Oregon Caves Highway the portion between the foot of the grade and the caves has been worked over and widened, with the exception of two miles. This work has been done by the Bureau of Public Roads and was accomplished during the last two winters when their shovel was placed on the section and was operated during the winter months. At this time there remain eight miles of the highway which is yet to be surfaced.

All state work in the county during the biennium has been handled under the supervision of W. E. Chandler, Division Engineer, with headquarters at Grants Pass.

State Line-Hayes Hill Maintenance Materials

On the Redwood Highway, from the California state line north to the summit of Hayes Hill, which is at Sta. 1363+00 and approximately four miles north of Selma; approximately 26 miles of highway for which materials were produced.

Contract No. 938, awarded January 27, 1927, to Simonsen & Hefty, of Portland, Oregon. Work commenced March 1, 1927; completed October 18, 1927. Final cost, $11,674.25. Resident Engineer, Jas. G. Toole.

The object of this contract was to get materials for oiling. A cost statement covering the work will be found in the article in this report applying to the Deer Creek-Hayes Hill surfacing project.

Deer Creek-Hayes Hill Surfacing

Federal Aid Project No. 127-B

On the Redwood Highway, from Sta. 1109+50, which station is about one-half mile south of Selma, north to Sta. 1363+00, which station is at the summit of Hayes Hill; 4.8 miles of surfacing.

Contract No. 938, awarded January 27, 1927, to Simonsen & Hefty, of Portland, Oregon. Work commenced June 15, 1927; completed October 18, 1927. Final cost, $21,343.24. Resident Engineers, Jas. G. Toole and C. H. Armstrong.

Due to the light nature of the grading on this section, the grading and surfacing were both completed in the same year.

[JOSEPHINE]

DETAILED STATEMENT OF EXPENDITURES

State Line-Deer Creek Maintenance Materials

Engineering		$ 628.49
Contract items as follows:		
Grade "A" gravel in stock pile, 1,890.83 cu. yds. at $1.50	$ 2,836.25	
Grade "B" gravel in stock pile, 4,569.17 cu. yds. at $1.50	6,853.76	
Grade "C" gravel in stock pile, 757.43 cu. yds. at $1.50	1,136.15	
Extra haul, pile measure, 998.17 yd. mi. at 22c	219.60	
Total amount paid to contractor		11,045.76
Sub-total (cost of maintenance materials)		$ 11,674.25

Deer Creek-Hayes Hill Surfacing

Engineering		$ 1,092.46
Sprinkling surfacing materials		1,900.38
Rolling sub-base materials		102.55
Contract items as follows:		
Sub-base surfacing, 6,012.0 cu. yds. at $1.38	$ 8,296.56	
Base course surfacing, 4,207.0 cu. yds. at $1.38	5,805.66	
Top course surfacing, 1,800.0 cu. yds. at $1.38	2,484.00	
Earth filler, 2,494.5 cu. yds. at 40c	997.80	
Filler haul, 3,268.25 yd. mi. at 18c	588.29	
Stripping filler pit, 181.6 cu. yds. at 25c	45.40	
Force account items:		
Shaping roadway south of Deer Creek bridge	30.14	
Total amount paid to contractor		18,247.85
Sub-total (cost of surfacing)		$ 21,343.24
Grand total cost of project, 1927-28		$ 33,017.49

PARTICIPATION IN COST

	State	*Government*	*Total*
Maintenance material project	$11,674.25	$	$ 11,674.25
Surfacing project	8,976.83	12,366.41	21,343.24
Total of expenditures	$20,651.08	$12,366.41	$ 33,017.49

O'Brien School-California Line Forest Road Project

This project was completed during prior years and a descriptive article will be found on page 323 of the last biennial report.

During the biennium the state has received a refund of $4,112.07 for excess cooperation previously paid on the grading. This refund reduces the total state expenditures on the grading to $75,887.93. The federal government has expended $10,000, making the total cost of the grading $85,887.93.

Hayes Hill-Shattuck Corner Surfacing

Federal Aid Project No. 127-B

On the Redwood Highway, from Sta. 1363+50, which station is at the summit of Hayes Hill and approximately four miles north of Selma, north and east to Sta. 2103+00, which station is near a point known as Shattuck Corners and about five miles south and west of Grants Pass; 10.77 miles of surfacing and 1.87 miles resurfacing. The resurfacing included that portion from the summit of Hayes Hill north to the foot of Hayes Hill. This contract also included the furnishing of maintenance materials in stock piles.

[JOSEPHINE]

Contract No. 979, awarded June 23, 1927, to Harness & Colby, of Roseburg, Oregon. Work commenced August 30, 1927; completed July 1, 1928. Final cost, $77,985.74. Resident Engineer, C. H. Armstrong.

The completion of this project was the last link for the completed highway in Oregon.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,352.73
Labor and materials furnished by state:		
Royalties paid on surfacing materials		1,717.10
Sprinkling surfacing materials		1,811.17
Extending culverts		29.48
Labor and equipment rentals deducted from contractor's estimate		295.28
Contract items as follows:		
Sub-base course surfacing, 13,281.5 cu. yds. at $1.40	$18,594.10	
Base course surfacing, 8,306.0 cu. yds. at $1.65	13,704.90	
Top course surfacing, 4,829.0 cu. yds. at $1.80	8,692.20	
Grade "A" maintenance materials, 1,584.5 cu. yds. at $2.20	3,485.90	
Grade "B" maintenance materials, 1,490.4 cu. yds. at $1.80	2,682.72	
Grade "C" maintenance materials, 7,452.0 cu. yds. at $1.40	10,558.80	
Grade "AB" maintenance materials, 1,796.0 cu. yds. at $2.20	3,951.20	
Grade "E" maintenance materials, 2,250.0 cu. yds. at $1.40	3,150.00	
Earth filler, 2,698.6 cu. yds. at 25c	674.65	
Filler haul, 2,338.5 yd. mi. at 25c	584.63	
1-inch maintenance materials, 151.0 cu. yds. at 80c	120.80	
Extra haul to stock pile, 101.5 yd. mi. at 22c	22.33	
Truck haul, 1,177.5 yd. mi. at 18c	211.95	
Force account items:		
Preparing stock pile sites	612.73	
Building cattle guards on hauling road	111.65	
Regrading made necessary by slides and settlement of embankment	2,917.30	
Total amount earned by contractor	$70,075.86	
Deduction for blading road with state equipment	295.88	
Total amount paid to contractor		69,779.98
Grand total cost of project, 1927-28		$ 77,985.74

PARTICIPATION IN COST

	State	*Government*	*Total*
Total expended to date	$ 64,772.61	$ 13,213.13	$ 77,985.74
Estimated balances to complete	Cr. 24,948.07	24,948.07	
Estimated total costs	$ 39,824.54	$ 38,161.20	$ 77,985.74

Oregon Caves Forest Road Widening

This work has been handled by the Bureau of Public Roads and has been a continuing project during the past two years. The work was carried out on the plan of widening the worst places first and of spending the money where it would do the most good throughout the length of the project. All of the worst points now have been widened and passing places have been provided within sight of each other throughout the entire length of the project. The work is approximately 60 per cent completed at the present time.

The total estimated cost is $53,500, made up of $25,000 from state funds, $5,000 from county funds and $23,500 from federal government funds. Expenditures to date have amounted to $52,969.75, consisting of the full state and county cooperative shares and $22,969.75 from government funds.

[JOSEPHINE]

O'Brien School-George Ranch Surfacing

On the Redwood Highway, from Sta. 285+00, which station is near the O'Brien school, north to Sta. 741+00, which station is near the George ranch and approximately 29 miles southwest of Grants Pass; 8.64 miles of surfacing and furnishing maintenance materials in stock piles.

Contract No. 829, awarded June 26, 1925, to Joslin & McAllister, of Spokane, Washington. Work commenced July 25, 1925; completed July 23, 1926. Final cost, $43,797.20. Resident Engineer, R. L. Kuney.

Further details will be found on page 321 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,203.13
Royalty paid for binder material		148.05
Sprinkling surfacing materials by state forces		2,410.21
Contract items as follows:		
Crushed gravel surfacing, base, 7,985.0 cu. yds. at $1.85	$14,772.25	
Crushed gravel surfacing, top, 7,875.0 cu. yds. at $1.85	14,568.75	
Maintenance material, 1,815.0 cu. yds. at $1.63	2,958.45	
Earth filler, 7,654.0 cu. yds. at 20c	1,530.80	
Filler payhaul, 12,856.0 yd. mi. at 20c	2,571.20	
Force account items:		
Clearing and grubbing borrow pits and hauling material to approaches of West Fork Illinois River bridge	174.06	
Backfilling and raising grade Sta. 628 to 630	32.65	
Reconstructing subgrade on approaches to East Fork of Illinois River bridge	185.52	
Replacing washed out fill at north approach to Rough and Ready Creek bridge	54.33	
Removing loose rocks to avoid use of earth cushion material in subgrade	103.09	
Hauling material to repair washout and settlement Sta. 303 to 320	97.44	
Building road from highway to Rough and Ready Creek to procure water for sprinkling	58.31	
Widening and deepening ditches to improve drainage	355.43	
Sinking test pits for clay binder site	38.17	
Developing rejected quarry site at Sta. 645	1,535.36	
Total amount paid to contractor		39,035.81
Grand total cost of project		$ 43,797.20

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$41,244.69	$	$ 41,244.69
Expended 1927-28 biennium	Cr. 7,447.49	10,000.00	2,552.51
Total of expenditures	$33,797.20	$10,000.00	$ 43,797.20

Redwood Junction-Wells Ranch Grading

On the Oregon Caves Highway, from Sta. 17+37, which station is 1,737 feet east of junction of the Oregon Caves Highway with the Redwood Highway, east to Sta. 247+42, which station is near Wells ranch; 4.32 miles of grading.

Contract No. 841, awarded July 28, 1925, to Earl McNutt, of Eugene, Oregon. Work commenced August 12, 1925; completed November 14, 1925. Final cost, $24,749.49. Resident Engineer, R. L. Kuney.

This project was opened during the present biennium only to record the payment of $121.60 to J. A. Varner for constructing the embankment approaches to the bridges on this section. The final cost now stands at $24,749.49, all from state funds.

Further details will be found on page 325 of the 1925-26 report.

[JOSEPHINE]

George Ranch-Deer Creek Surfacing

Federal Aid Project No. 127-A

On the Redwood Highway, from Sta. 746+00, which station is about one mile south of Kerby, north to Sta. 1108+80, which station is about one-half mile south of Selma; 6.88 miles of surfacing and the furnishing of maintenance materials in stock pile.

Contract No. 882, awarded May 25, 1926, to Harness & Colby, of Roseburg, Oregon. Work commenced July 15, 1926; completed October 24, 1926. Final cost, $34,929.65. Resident Engineers, R. L. Kuney and Jas. G. Bromley.

Further details will be found on page 321-2 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,698.15
Sprinkling surfacing materials by state forces		1,203.26
Royalty paid for surfacing material		68.35
Tractor parts and repairs furnished to contractor		320.19
Contract items as follows:		
Base course surfacing, 6,960.0 cu. yds. at $1.31	$ 9,117.60	
Top course surfacing, 7,986.0 cu. yds. at $1.80	14,374.80	
Maintenance materials, base, 500.0 cu. yds. at $1.31	655.00	
Maintenance materials, top, 2,700.0 cu. yds. at $1.80	4,860.00	
Earth filler, 3,878.5 cu. yds. at 20c	775.70	
Filler haul, 5,346.25 yd. mi. at 18c	962.33	
Force account items:		
Clear, grub and remove overburden from filler site	129.29	
Raking rock from filler while processing materials	85.17	
Total amount earned by contractor	$30,959.89	
Deduction for tractor parts and repairs furnished by the state	320.19	
Total amount paid to contractor		30,639.70
Grand total cost of project		$ 34,929.65

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$33,466.42	$	$ 33,466.42
Expended 1927-28 biennium	Cr. 16,635.95	18,099.18	1,463.23
Total of expenditures	$16,830.47	$18,099.18	$ 34,929.65

George Ranch-Deer Creek Grading

Federal Aid Project No. 127-A

On the Redwood Highway, from Sta. 746+00, which station is approximately one mile south of Kerby, north to Sta. 1108+80, which station is approximately one-half mile south of Selma; 6.88 miles of grading.

Contract No. 861, awarded January 19, 1926, to E. L. McNutt, of Eugene, Oregon. Work commenced January 23, 1926; completed August 12, 1926. Final cost, $73,210.54. Resident Engineer, R. L. Kuney.

No additional expenditures have been made during the biennium. Excess prior federal cooperation, to the amount of $2,317.17, credited to this work, has been transferred out to other projects. The final cost now consists of $29,404.09 from state funds and $43.806.45 from government funds.

Further details will be found on page 324 of the 1925-26 report.

[JOSEPHINE]

Redwood Junction-Grayback Creek Surfacing

On the Oregon Caves Highway, from Sta. 0+00 at the junction of the Oregon Caves Highway with the Redwood Highway, east to the crossing of Grayback Creek at Sta. 40+80; 11.78 miles of surfacing and the placing of some maintenance materials in stock piles.

Contract No. 829, awarded June 26, 1925, to Joslin & McAllister, of Spokane, Washington. Work commenced July 25, 1925; completed July 23, 1926. Final cost, $51,530.72. Resident Engineer, R. L. Kuney.

Further details will be found on page 320 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,297.34
Royalty on 1,873.0 cu. yds. binder material at 3c		56.19
Sprinkling surfacing materials by state forces		1,273.69
Hauling crushed rock to soft spots in grade		198.00
Contract items as follows:		
Crushed rock surfacing, base, 7,870.0 cu. yds. at $2.12	$16,684.40	
Crushed rock surfacing, top, 8,030.0 cu. yds. at $2.12	17,023.60	
Maintenance material, 700.0 cu yds. at $1.90	1,330.00	
Crushed gravel surfacing, base, 2,225.0 cu. yds. at $1.85	4,116.25	
Crushed gravel surfacing, top, 2,660.0 cu. yds. at $1.85	4,921.00	
Earth filler, 7,931.0 cu. yds. at 20c	1,586.20	
Filler payhaul, 6,840.0 yd. mi. at 20c	1,368.10	
Force account items:		
Raking rock from filler	262.73	
Removing slides and digging ditches	170.25	
Building up bridge approach fills	116.69	
Repairing washouts and grade settlements	126.28	
Total amount paid to contractor		47,705.50
Grand total cost of project		$ 51,530.72

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$50,129.14	$	$ 50,129.14
Expended 1927-28 biennium	Cr. 8,598.42	10,000.00	1,401.58
Total of expenditures	$41,530.72	$10,000.00	$ 51,530.72

O'Brien School-George Ranch Grading

On the Redwood Highway, from Sta. 285+00, which station is near the O'Brien school and about six miles north of the California state line, north and east to Sta. 741+00, which station is near the George ranch and about 1.3 miles south of Kerby. It does not include any work between Sta. 647+33.7 and Sta. 673+11.7, which work was completed under previous contract; 8.15 miles of grading.

Contract No. 795, awarded April 23, 1925, to Dunn & Baker, of Klamath Falls, Oregon. Work commenced May 4, 1925; completed December 6, 1925. Final cost, $68,244.34. Resident Engineer, R. L. Kuney.

The opening of this project during the present biennium was made necessary only to record the payment of $859 to J. A. Varner for constructing the approach embankments to the bridges on this section. The final cost of the project is now $68,244.34, the state having paid $48,244.34 and the county $20,000.

Further details will be found on page 323 of the 1925-26 report.

[JOSEPHINE]

Hayes Hill-Shattuck Corner Grading

Federal Aid Project No. 127-C

On the Redwood Highway, from Sta. 1462+00, which station is at the foot of Hayes Hill and about 16 miles south and west of Grants Pass, to Sta. 2103+00, which station is near the point known as Shattuck Corner and about five miles south and west of Grants Pass; 10.69 miles of grading.

Contract No. 934, awarded December 22, 1926, to Washburn & Hall, of Portland, Oregon. Work commenced January 25, 1927; completed April 15, 1928. Final cost, $144,134.12. Resident Engineer, C. H. Armstrong.

This was the last grading job on the Redwood Highway and its completion met the opening to travel of this highway in Oregon.

Detailed Statement of Expenditures

Engineering		$ 12,293.60
Labor and materials furnished by the state:		
Maintaining completed portions of highway		509.96
Prospecting for surfacing materials		10.25
Signs for traffic control		33.40
Reinforcing steel and bull's-eyes sold to contractor		502.40
Contract items as follows:		
Clearing and grubbing, all	$10,000.00	
Common excavation, 88,228.9 cu. yds. at 38c	33,526.98	
Solid rock excavation, 90,493.1 cu. yds. at 58c	52,486.00	
Overhaul, 334,415.0 yd. sta. at 3c	10,032.45	
12-inch concrete pipe, 1,635.0 lin. ft. at $1.50	2,452.50	
18-inch concrete pipe, 1,503.0 lin. ft. at $2.50	3,757.50	
24-inch concrete pipe, 957.0 lin. ft. at $3.15	3,014.55	
30-inch concrete pipe, 336.0 lin. ft. at $5.00	1,680 00	
12-inch concrete siphon pipe, 81.0 lin. ft. at $2.25	182.25	
18-inch concrete siphon pipe, 258.0 lin. ft. at $3.25	838.50	
24-inch concrete siphon pipe, 234.0 lin. ft. at $4.50	1,053.00	
6-inch porous drain tile, 1,432.0 lin. ft. at 25c	358.00	
Rock backfill, 248.02 cu. yds. at $2.00	496.04	
Class "A" concrete, 217.9 cu. yds. at $24.00	5,229.60	
Class "C" concrete, 41.15 cu. yds. at $24.00	987.60	
Metal reinforcement, 20,042.93 lbs. at 7c	1,403.01	
Lumber and timber, 20.133 M-FBM at $50.00	1,006.65	
Gravel, 75.0 cu. yds. at $1.40	105.00	
Force account items:		
Extra clearing for ditches and line changes	502.39	
Prospecting for surfacing materials	277.84	
Placing 6-inch siphon pipe at Sta. 1790	106.12	
Reconstructing private water pipe lines	334.68	
Lowering and moving old pipe culverts	200.44	
Rebuilding RR telephone line near Station 1600	308.00	
Raising spur tracks, Stations 1473 and 1565	416.55	
Refinishing and resloping where required	531.26	
Total amount earned by contractor	$131,286.91	
Deduction for materials furnished by state	502.40	
Total amount paid to contractor		130,784.51
Grand total cost of project, 1927-28		$144,134.12

PARTICIPATION IN COST

	State	*Government*	*Total*
Total expended to date	$67,728.96	$76,405.16	$144,134.12
Estimated balances to complete	Cr. 2,524.24	2,524.24	.....
Estimated total costs	$65,204.72	$78,929.40	$144,134.12

[JOSEPHINE]

Deer Creek-Hayes Hill Grading

Federal Aid Project No. 127-B

On the Redwood Highway, from Sta. 1109+50, which station is about one-half mile south of Selma, north to Sta. 1363+00, which station is at the summit of Hayes Hill; 4.8 miles of grading.

Contract No. 929, awarded October 26, 1926, to Schell & Rhodes, of Oakland, Oregon. Work commenced December 1, 1926; completed August 31, 1927. Final cost, $52,059.05. Resident Engineer, Jas. G. Toole.

Detailed Statement of Expenditures

Engineering		$ 5,633.66
Maintaining completed portion of grade		65.00
Metal reinforcement sold to contractor		364.86
Contract items as follows:		
Clearing and grubbing, all	$ 3,600.00	
Excavation, single classification, 73,300.2 cu. yds. at 40c	29,320.08	
Overhaul, 85,143.0 yd. sta. at 5c	4,257.15	
12-inch concrete pipe, 492.0 lin. ft. at $1.60	787.20	
18-inch concrete pipe, 288.0 lin. ft. at $3.00	864.00	
24-inch concrete pipe, 315.0 lin. ft. at $4.00	1,260.00	
30-inch concrete pipe, 297.0 lin. ft. at $5.00	1,485.00	
Class "A" concrete, 95.17 cu. yds. at $28.00	2,664.76	
Metal reinforcement, 9,403.7 cu. yds. at 7c	658.26	
Riprap, 300.3 cu. yds. at $3.50	1,051.05	
Force account items:		
Clearing and grubbing for channel changes	412.89	
Total amount earned by contractor	$46,360.39	
Deduction for metal reinforcement furnished by the state	364.86	
Total amount paid to contractor		45,995.53
Grand total cost of project		$ 52,059.05

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$ 284.36	$	$ 284.36
Expended 1927-28 biennium	20,497.29	31,277.40	51,774.69
Total of expenditures	$20,781.65	$31,277.40	$ 52,059.05

Allen Creek Culvert near Grants Pass

On the Redwood Highway, near Grants Pass; double six by seven-foot box culvert.

Contract No. 995, awarded August 30, 1927, to E. D. Olds, of Oak Grove, Oregon. Work commenced October 1, 1927; completed November 15, 1927. Final cost, $3,604.17. Resident Engineer, C. A. Jordan.

This work was sublet to Hampton and Crondall.

Detailed Statement of Expenditures

Engineering		$ 364.07
Contract items as follows:		
Excavation, 108.65 cu. yds. at $4.00	$ 434.60	
Class "A" concrete, 127.1 cu. yds. at $16.00	2,033.60	
Metal reinforcement, 12,865.0 lbs. at 6c	771.90	
Total amount paid to contractor		3,240.10
Grand total cost of structure, all state funds, 1927-28		$ 3,604.17

[JOSEPHINE]

George Ranch-Deer Creek Bridges

Federal Aid Project No. 127-A

On the Redwood Highway, near Kerby; two bridges and eight culverts, all concrete.

Contract No. 863, awarded January 19, 1926, to A. G. Enright, of Goldson, Oregon. Work commenced February 5, 1926; completed August 31, 1926. Final cost, $19,167.75. Resident Engineers, J. T. Skelton and Jos. A. Weber, successively.

This project has been opened during the present biennium only to record the final expenditures on the work.

Further details will be found on page 326 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,609.37
Name plates furnished by the state		26.59
Bull's-eye reflectors sold to contractor		38.14
Contract items as follows:		
Reeves Creek Bridge		
Excavation, 150.0 cu. yds. at $2.00	$ 300.00	
Class "A" concrete, 94.54 cu. yds. at $22.00	2,079.88	
Class "D" concrete, 21.95 cu. yds. at $24.00	526.80	
Metal reinforcement, 11,572.0 lbs. at 4½c	520.74	
Concrete handrail, 70.0 lin. ft. at $6.00	420.00	
Cement correction, 17.04 bbls. at $4.40	74.98	
Backfill material, 392.0 cu. yds. at 51c	199.92	
Horton Creek Bridge		
Excavation, 160.58 cu. yds. at $2.00	321.16	
Class "A" concrete, 91.40 cu. yds. at $22.00	2,010.80	
Class "D" concrete, 12.65 cu. yds. at $24.00	303.60	
Metal reinforcement, 10,761.0 lbs. at 4½c	484.25	
Concrete handrail, 50.0 lin. ft. at $6.00	300.00	
Cement correction, 16.25 bbls. at $4.40	71.50	
Box Culverts		
Excavation, 594.91 cu. yds. at $2.00	1,189.82	
Class "A" concrete, 273.57 cu. yds. at $22.00	6,018.54	
Metal reinforcement, 24,971.0 lbs. at 4½c	1,123.70	
Cement correction, 26.38 bbls. at $4.40	116.07	
Force account items:		
Constructing and maintaining detours	424.64	
Placing left-over steel in warehouse	45.39	
Total amount earned by contractor	$16,531.79	
Deduction for bullseye reflectors furnished by the state	38.14	
Total amount paid to the contractor		16,493.65
Grand total cost of structures		$ 19,167.75

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$18,734.02	$	$ 18,734.02
Expended 1927-28 biennium	Cr. 10,587.91	11,021.64	433.73
Total of expenditures	$ 8,146.11	$11,021.64	$ 19,167.75

Grants Pass-Jackson County Line Survey

This survey covers a revision of the existing alignment of a portion of the highway south of Grants Pass which lies between Mile Post 281.0 and Mile Post 285.3 at the Jackson County line.

The survey was made by C. H. Armstrong, Resident Engineer, between January 29 and March 5, 1928.

[JOSEPHINE]

Kerby-Selma Bridges

On the Redwood and Oregon Caves Highways, near Kerby; five bridges on the Redwood Highway; one bridge and four culverts on the Oregon Caves Highway.

Contract No. 813, awarded May 8, 1925, to J. A. Varner, of Grants Pass, Oregon. Work commenced June 5, 1925; completed July 31, 1926. Final cost, $69,121.85. Resident Engineer, J. T. Skelton.

This project has been held open during the present biennium only to record final expenditures on the work.

Further details will be found on page 326 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,687.24
Bronze name plates		117.41
Reconstructing irrigation dam at Deer Creek Crossing		250.00
Engineering expense charged to contractor		653.16
Contract items as follows:		
Excavation to plan elevation, 1,788.47 cu. yds. at $1.50	$ 2,682.71	
Excavation below elevation, 111.8 cu. yds. at $3.00	335.40	
Fir piling, 714.5 lin. ft. at 60c	428.70	
Class "A" concrete, 672.75 cu. yds. at $28.00	18,837.00	
Class "B" concrete, 127.45 cu. yds. at $27.00	3,441.15	
Class "D" concrete, 184.0 cu. yds. at $29.00	5,336.00	
Metal reinforcement, 93,483.5 lbs. at 6.35c	5,936.20	
Lumber, 7.725 M-FBM at $60.00	463.50	
Structural steel, 302,024.0 lbs. at 7.6c	22,953.82	
Trestle superstructure, 95.0 lin. ft. at $16.00	1,520.00	
Concrete handrail, 239.0 lin. ft. at $4.00	956.00	
Removal of old bridges and maintenance of traffic, all	500.00	
Cement correction as per contract	40.97	
Force account items:		
Furnishing Port Orford cedar piling for approaches to West Fork Illinois River bridge	375.70	
Drilling holes for vertical barrel steel into seal	24.51	
Removing fire hazard trees	31.66	
Metal water stops for culverts and bridges	177.77	
Constructing pavement bracket at Deer Creek bridge	26.11	
Total amount earned by contractor	$64,067.20	
Deduction for engineering expense charged to contractor	653.16	
Total amount paid to contractor		63,414.04
Grand total cost of project		$ 69,121.85

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$67,072.17	$	$ 67.072.17
Expended 1927-28 biennium	Cr. 17,950.32	20,000.00	2,049.68
Grand total cost of project	$49,121.85	$20,000.00	$ 69,121.85

O'Brien School-Waldo Survey

This survey was made by James G. Bromley, Resident Engineer, for Josephine County, and covers a portion of the county highway 3.1 miles in length between a junction with the Redwood Highway at the O'Brien school and the old town of Waldo. The work was done in March and April of 1927.

[JOSEPHINE]

Six Bridges on the Redwood Highway

Federal Aid Project No. 127-B

On the Pacific Highway, near Grants Pass.

Contract No. 942, awarded January 27, 1927, to O. N. Pierce Company, of Portland, Oregon. Work commenced April, 20, 1927; completed August 15, 1927. Final cost, $24,906.01. Resident Engineer, C. A. Jordan.

This contract included a 40-foot concrete span over Clear Creek, a 20-foot concrete span over Clear Creek, a 30-foot concrete span over Waters Creek, a 30-foot concrete span over Slate Creek, a 35-foot concrete span over Slate Creek and a 35-foot concrete span over Butcherknife Creek.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,893.24
Name plates furnished by the state		73.56
Contract items as follows:		
Excavation, 862.96 cu. yds. at $2.25	$ 1,941.67	
Class "A" concrete, 473.49 cu. yds. at $23.00	12,244.05	
Class "D" concrete, 112.15 cu. yds. at $24.00	2,691.60	
Metal reinforcement, 790.61 lbs. at 5c	3,953.05	
Concrete handrail, 464.5 lin. ft. at $4.00	1,858.00	
Force account items:		
Waterproofing footings and wingwalls	250.84	
Total amount paid to contractor		22,939.21
Grand total cost of structure, 1927-28		$ 24,906.01

PARTICIPATION IN COST

	State	*Government*	*Total*
Total expended to date	$11,581.83	$13,324.18	$ 24,906.01
Estimated balances to complete	Cr. 2,996.69	2,996.69	.....
Estimated total costs	$ 8,585.14	$16,320.87	$ 24,906.01

Oregon Caves Forest Road Survey

Upon the completion of the widening of the Oregon Caves Forest Road section, it was decided to make a location survey for the full length of Hill section in order that a close estimate might be made of the work remaining to be done and to coordinate future work with that which already had been done in the widening program. With this purpose in view, a location survey was begun by the Bureau of Public Roads during 1928. The total estimated cost of this survey is $2,500, to be paid entirely from government funds, of which amount $2,100.18 has been expended to date.

Grants Pass-Applegate River Survey

This survey work included the making of small revisions in the located line and the getting of property rights and descriptions before actual construction. The work was done by C. H. Armstrong, Resident Engineer, between January and March of 1927. The net length surveyed was two miles.

[JOSEPHINE]

Applegate River-George Ranch Survey

This survey was undertaken during the previous biennium and a descriptive article will be found on page 328 of the last report. During the present biennium some additional entries have been made on the books in order to cover the final expenditures on the work.

Wolf Creek-Grave Creek Survey

Major revisions of the alignment were contemplated in this section and for this reason a final survey was desired. Several lines were projected and a study has been made of each one. Many changes are under consideration on the section at this time but final decisions have not been made. The field work was done by W. M. Strohmeyer and C. H. Armstrong, Resident Engineers.

The work has been a continuation of some surveys which were made in the previous biennium and an article descriptive thereof will be found on page 329 of the last report.

KLAMATH COUNTY

The program of the State Highway Department has progressed rapidly in this county during the past biennium. The Dalles-California Highway is now oiled over the entire distance from the Deschutes County line to Klamath Falls. A contract for resurfacing between Klamath Falls and Merrill has been awarded and this unit will receive oiled macadam treatment during the coming year. A contract for resurfacing the Ashland-Klamath Falls Highway between Klamath Falls and Keno also has been awarded and an oiled macadam surface on this unit will follow.

The same procedure leading up to an oiled macadam surface has been instituted on the portion of the Klamath Falls-Lakeview Highway between a junction with The Dalles-California Highway and a point approximately 10 miles east toward Lakeview. In fact, the entire Klamath Falls-Lakeview Highway is now in line for early completion. A contract for the grading between Dairy and Lorenz Mill has been awarded and the work should be completed early during the year 1929. The completion of this contract will finish up the last unit of grading required on the highway. It also is probable that all of the surfacing required will be finished during 1929. The completion of this work will provide a standard graded and surfaced highway between Lakeview and Klamath Falls and for the first time in history will provide a standard highway between these two points which can be traveled throughout the entire year. In addition to the work mentioned above, the Devils Garden section has been graded and surfaced during 1928 and is now open for traffic. The finishing of this particular unit has been looked forward to by the residents of Lake County for some time and its completion is a great relief to people who have found it necessary to travel the old highway.

The Dalles-California Highway south to Crescent and the portion of the Fremont Highway within the county are under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend. The balance of the highways in the county are now under the supervision of W. E. Chandler, Division Engineer, with headquarters at Grants Pass. Prior to this biennium all of the highways within the county were under the supervision of Mr. Wanzer. A revision of division boundaries, however, has now segregated the various highways in the manner stated.

Beatty-Forest Boundary Surfacing

On the Klamath Falls-Lakeview Highway, from Sta. 1488+40, which station is in the town of Beatty, east to Sta. 2601+00, which station is near the west boundary of the Fremont National Forest; 21.01 miles of surfacing and the furnishing of maintenance materials in stock piles.

Contract No. 1,036, awarded April 20, 1928, to Wren & Greenough, of Portland, Oregon. Work commenced July 2, 1928. Estimated cost, $180,000 from state funds. Expenditures to date, $79,873. Resident Engineer, Jos. G. Toole.

This project is now about two-thirds completed and is progressing at the rate of between 500 and 600 cubic yards per day. A total of 920 cubic

yards per mile of maintenance material is being stock piled instead of 400 as provided by the contract. In order to do this, 520 cubic yards per mile less material is being placed on the road. The idea is to bind this material with oil instead of clay.

Lapine-Corral Springs Surfacing

Federal Aid Project No. 108-120-126

On The Dalles-California Highway, from Lapine to a point 28.19 miles south, 10.72 miles south of Crescent, being 4.15 miles in Deschutes County and 24.04 miles in Klamath County; 28.19 miles of surfacing.

Contract No. 854, awarded October 27, 1925, to Carl Nyberg, of Spokane, Washington. Work commenced April 11, 1926; completed November 13, 1926. Final cost, $226,492.50. Resident Engineer, J. R. Mitchell.

Further details will be found on page 330 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,181.05
Sprinkling surfacing materials		10,983.97
Contract items as follows:		
North Unit		
Base course surfacing, 23,569.5 cu. yds. at $3.10	$ 73,065.45	
Top course surfacing, 23,902.5 cu. yds. at $3.20	76,488.00	
Maintenance materials, 6,502.3 cu. yds. at $2.00	13,004.60	
Earth filler, 14,138.0 cu. yds. at 30c	4,241.40	
Screenings for oil squeegee, 67.5 cu. yds. at $2.00	135.00	
Total of North Unit	$166,934.45	
South Unit		
Base course surfacing, 6,588.5 cu. yds. at $3.10	$20,424.35	
Top course surfacing, 6,484.5 cu. yds. at $3.20	20,750.40	
Maintenance materials, 2,300.0 cu. yds. at $2.00	4,600.00	
Earth filler, 3,886.7 cu. yds. at 30c	1,166.01	
Force account items:		
Raising grade and widening ditches	147.00	
Building trap at maintenance pile	305.27	
Total of South Unit	$ 47,393.03	
Total amount earned by contractor	$214,327.48	
Lump sum deduction as per contract	3,000.00	
Total amount paid to contractor		211,327.48
Grand total cost of project		$226,492.50

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$ 5,837.62	$182,723.67	$188,561.29
Expended 1927-28 biennium	94,717.84 Cr.	56,786.63	37,931.21
Total of expenditures	$100,555.46	$125,937.04	$226,492.50

Bly Mountain-Beatty Surfacing

On the Klamath Falls-Lakeview Highway, from Bly Mountain, which point is approximately 7.7 miles north of Bonanza, north to Beatty; 13.45 miles of surfacing, 14 feet wide on top, 18 feet on bottom, depth eight inches, loose measure.

[KLAMATH]

Contract No. 874, awarded April 29, 1926, to R. W. Stevenson, of Mt. Vernon, Washington. Work commenced June 10, 1926. Final cost, $82,660.45. Resident Engineer, A. A. Kirkwood.

Further details will be found on page 331-2 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,377.21
Labor and materials furnished by the state:		
Sprinkling surfacing materials		3,650.00
Royalty paid for filler materials		138.71
Contract items as follows:		
Base course surfacing, 13,802.0 cu. yds. at $2.35	$32,434.70	
Top course surfacing, 12,310.5 cu. yds. at $2.35	28,929.68	
Maintenance materials, 4,109.6 cu. yds. at $1.75	7,191.80	
Earth filler, 10,237.5 cu. yds. at 30c	3,071.25	
Filler haul, 12,835.5 yd. mi. at 20c	2,567.10	
Clearing and stripping filler pits	300.00	
Total amount paid to contractor		74,494.53
Grand total cost of project		$ 82,660.45

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$28,445.44	$22,768.59	$ 51,214.03
Expended 1927-28 biennium	15,073.39	16,373.03	31,446.42
Total of expenditures	$43,518.83	$39,141.62	$ 82,660.45

Sand Creek Hill-Williamson River Maintenance Material

On The Dalles-California Highway, from Mile Post 245, at the bottom of Sand Creek Hill, 2.8 miles north of the Fort Klamath Junction, south to Mile Post 261 at Williamson River; 16 miles of furnishing maintenance materials.

Contract No. 950, awarded March 3, 1927, to W. D. Miller Construction Company, of Klamath Falls, Oregon. Work commenced April 21, 1927; completed November 23, 1927. Final cost, $21,241.76. Resident Engineer, C. C. Seeley.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 786.05
Purchase of Orville Elliott quarry site		557.00
Engineering costs charged to contractor		1,064.10
Contract items as follows:		
Grade "A" materials in piles, 1,712.7 cu. yds. at $2.15	$ 3,682.31	
Grade "B" materials in piles, 1,842.4 cu. yds. at $2.05	3,776.92	
Grade "C" materials in piles, 3,477.6 cu. yds. at $2.10	7,302.96	
Grade "D" materials in piles, 428.4 cu. yds. at $2.05	878.22	
Grade "A" materials in trucks, 31.0 cu. yds. at $2.25	69.75	
Grade "B" materials in trucks, 160.5 cu. yds. at $2.15	345.08	
Hauling broken stone, 20,211.3 yd. mi. at 18c	3,638.03	
Force account items:		
Clearing and leveling stock pile sites	205.44	
Total amount earned by contractor	$19,898.71	
Deduction for engineering costs after time limit	1,064.10	
Total amount paid to contractor		18,834.61
Grand total cost of project, all state funds, 1927-28		$ 21,241.76

[KLAMATH]

Klamath Falls-Merrill-Olene Resurfacing

On The Dalles-California Highway, from Mile Post 288.4, which mile post is about one mile south of the south corporate limits of Klamath Falls, south to Mile Post 305.5, which mile post is in Merrill, and on the Klamath Falls-Lakeview Highway from Mile Post 0.0, at the junction with The Dalles-California Highway, east to Mile Post 1.6; 18.7 miles of resurfacing and the furnishing of maintenance materials.

Contract No. 1,024, awarded December 20, 1927, to John Hampshire, of Grants Pass, Oregon. Work commenced April 12, 1928. Estimated cost, $150,000 from state funds. Expenditures to date, $76,694.03. Resident Engineer, C. C. Seeley.

This contract has been altered to include 10 miles of resurfacing on the Klamath Falls-Lakeview Highway instead of 1.6 miles, and 10 miles of maintenance materials in stock piles at 700 cubic yards per mile instead of six miles at 600 cubic yards. The 2.8 miles of resurfacing on The Dalles-California Highway between Mile Posts 288.4 and 291.2 will not be completed this year.

Bly Mountain-Beatty Grading

On the Klamath Falls-Lakeview Highway, from Sta. 774+59.6, which station is about 7.7 miles north of Bonanza, north to Sta. 1448+40, which station is in the town of Beatty; 13.45 miles of grading.

Contract No. 830, awarded June 25, 1925, to James T. Logan, of Grants Pass, Oregon. Work commenced July 16, 1925; completed May 31, 1926. Final cost, $144,810.90. Resident Engineer, A. A. Kirkwood.

Further details will be found on page 336 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 7,389.62
Contract items as follows:		
Clearing and grubbing, all	$12,500.00	
Common excavation, 69,049.3 cu. yds. at 40c	27,619.72	
Intermediate excavation, 22,374.0 cu. yds. at 90c	20,136.60	
Solid rock excavation, 45,041.1 cu. yds. at $1.20	54,049.32	
Overhaul, 61,805.0 yd. sta. at 5c	3,090.25	
12-inch concrete pipe, 900.0 lin. ft. at $1.80	1,620.00	
18-inch concrete pipe, 1,256.0 lin. ft. at $3.20	4,019.20	
24-inch concrete pipe, 548.0 lin. ft. at $4.50	2,466.00	
36-inch concrete pipe, 388.0 lin. ft. at $7.10	2,754.80	
Class "A" concrete, 171.96 cu. yds. at $37.00	6,362.52	
Metal reinforcement, 16,336.0 lbs. at 10c	1,633.60	
Force account items:		
Removing house from right of way, Station 1234	92.90	
Clearing for borrow pit outside of right of way	122.83	
Building hand-placed rock headwalls	953.54	
Total amount paid to contractor		137,421.28
Grand total cost of project		$144,810.90

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$73,726.92	$66,395.12	$140,122.04
Expended 1927-28 biennium	2,373.35	2,315.51	4,688.86
Total of expenditures	$76,100.27	$68,710.63	$144,810.90

[KLAMATH]

Keno-Klamath Falls Resurfacing Materials

On the Ashland-Klamath Falls Highway, from Mile Post 45.0, which mile post is in the town of Keno, east to Mile Post 56.15, which mile post is at the south or west corporate limits of the city of Klamath Falls; 11.15 miles of resurfacing and the furnishing of maintenance materials in stock piles.

Contract No. 1,008, awarded October 25, 1927, to Simonsen & Hefty, of Portland, Oregon. Work commenced May 10, 1928. Estimated cost, $68,000, from state funds. Expenditures to date, $41,182.77. Resident Engineer, C. C. Seeley.

It is estimated that 5,765 cubic yards of maintenance materials will be remaining to be produced after November 30, 1928.

Bly-Forest Boundary Grading

On the Klamath Falls-Lakeview Highway, from Sta. 2147+25.6, which station is in Bly, east to Sta. 2601+00, which station is near the west boundary of the Fremont National Forest; 8.01 miles of grading.

Contract No. 1,017, awarded November 29, 1927, to W. C. Elliott, of Portland, Oregon. Work commenced February 1, 1928; completed October 31, 1928. Estimated cost, $81,000, consisting of $56,000 from state funds and $25,000 from county funds. Expenditures to date, $71,824.56, consisting of $48,943.79 from state funds and $22,880.77 from county funds. Resident Engineer, Jas. G. Toole.

This section, commonly known as the "Devils Garden," has been a difficult section due to the boulder formation. However, only a small amount of this material was moved. A large amount of cushion material was hauled in by trucks and the rock covered to a depth of six or eight inches. Some fills were made by hauling in clay or sand rather than to make cuts through this boulder formation.

Lapine-Fort Rock Forest Road Grading

This work is on the revised location of the Fremont Highway and is located through the forest reserve between Lapine and Fort Rock, being partially in Klamath County and partially in Lake County. The grading is being handled under a contract awarded to William Endicott of Madras, and at the present time is approximately 75 per cent complete. Work was commenced early during the summer of 1928.

The original project began at the forest boundary, about 13 miles southeast from Lapine, and extended to the Lake County line. After bids were received it was found that sufficient funds remained available to allow the extension of the project for an additional 2.3 miles. This additional work has been added to Mr. Endicott's contract.

The total estimated cost of the work is $46,000, which is to be paid entirely from federal government funds. Expenditures to date by the government have amounted to $28,604.05.

[KLAMATH]

Beatty-Bly Grading

On the Klamath Falls-Lakeview Highway, from Sta. 1488+40 in the town of Beatty, east to Sta. 2175+00 at Bly; 13 miles of grading.

Contract No. 903, awarded July 29, 1926, to Earl L. McNutt, of Eugene, Oregon. Work commenced August 21, 1926. Final cost, $68,952.49. Resident Engineer, A. A. Kirkwood.

Further details will be found on page 337 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 6,864.66
Contract items as follows:		
Clearing and grubbing, all	$ 2,500.00	
Common excavation, 89,724.8 cu. yds. at 35c	31,403.68	
Intermediate excavation, 11,346.7 cu. yds. at 48c	5,446.42	
Solid rock excavation, 11,047.8 cu. yds. at 85c	9,390.63	
Overhaul, 19,836.0 yd. sta. at 5c	991.80	
18-inch concrete pipe, 1,101.0 lin. ft. at $2.75	3,027.75	
24-inch concrete pipe, 1,230.0 lin. ft. at $3.50	4,305.00	
36-inch concrete pipe, 716.0 lin. ft. at $6.00	4,296.00	
Dry rubble, 30.3 cu. yds. at $2.00	60.60	
Force account items:		
Removing barn from right-of-way, Station 1545	285.66	
Removing small frame house, Station 2106	84.10	
Extra clearing outside of right-of-way	296.19	
Total amount paid to contractor		62,087.83
Grand total cost of project		$ 68,952.49

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925 26 biennium	$31.249.46	$	$ 31,249.46
Expended 1927-28 biennium	6,659.11	31,043.92	37,703.03
Total of expenditures	$37,908.57	$31,043.92	$ 68,952.49

Deschutes County Line-Crescent Grading

Federal Aid Project No. 120

On The Dalles-California Highway, from the Deschutes County line, Sta. 914+77, south to a point near the south limits of the town of Crescent, Sta. 1620+20; 13.32 miles of grading, standard roadbed.

Contract No. 821, awarded June 25, 1925, to Newport Construction Company, of Portland, Oregon. Work commenced July 6, 1925; completed October 20, 1925. Final cost, $28,443.61. Resident Engineer, J. R. Mitchell.

The project was opened during the present biennium for the purpose of redistributing the government funds. The final cost now consists of $13,613.41 of state funds and $14,830.20 of government funds.

Further details will be found on page 335 of the 1925-26 report.

Beaver Marsh Forest Road Project

This work was completed during previous years and a descriptive article will be found on page 332 of the last biennial report.

During the biennium the state has expended an additional $362.53. The total cost of the project now amounts to $227,525.06, of which the state has paid $113,762.53 and the federal government has expended a like amount.

[KLAMATH]

Corral Springs and Crescent Forest Road Project

This project was completed during the previous biennium and a descriptive article will be found on page 332 of the last report.

During the last two years the state has received a refund of $2,492.58 for excess cooperation previously paid. The completed project now represents a total expenditure of $139,790.92, of which the state has paid $65,043.75, Klamath County $15,007.46 and the federal government $59,739.71.

Klamath Falls-Lakeview Junction Survey

The traffic on this section is exceedingly heavy and it is probable that in the future reconstruction involving the use of some type of pavement will be necessary. In order to make a study of the situation and to plan upon improvement of the existing grades and curvature a relocation survey has been made. This work was done in June, 1928, by C. C. Seeley, Resident Engineer, and covers a total distance of 3.72 miles between terminal points.

Dairy-Bly Mountain Survey

This survey began at a point approximately three-tenths of a mile west of the Dairy postoffice and extended to a point approximately 13.4 miles south and west of the town of Beatty. The work consisted of a relocation in order to better the alignment, grade and drainage of the survey made during previous years. The work was handled by J. G. Toole, Resident Engineer, who began operations on January 1, 1928, and completed the work on April 1, 1928.

Bly-Forest Boundary Survey

The location of this section was completed during the previous biennium and a descriptive article will be found on page 340 of the last report under the title of "Dairy-Lake County Line Survey."

During the present biennium a revised survey was made just before construction. This work was done by J. G. Toole, Resident Engineer, between October 2 and December 31, 1927. A total of eight miles was located.

Jackson County Line-Klamath Falls Survey

Very little field work was done on this during the biennium and the major charges made cover office work on the old construction sections and preparation for a resurvey of the portion between the Jackson county line and Keno. This work has been done by C. H. Armstrong, Resident Engineer.

LAKE COUNTY

The state work in this county during the past two years has consisted of the surfacing of the section of 16 miles of the Klamath Falls-Lakeview Highway and the grading of the Paisley-Chalk Cliff Section, 10.87 miles, of the Fremont Highway.

The remaining unimproved section of the Fremont Highway was surveyed and estimates of cost made for its completion. Some surfacing work was done in the town of Lakeview on a cooperative basis with Lake County.

The uncompleted sections of the Fremont Highway in Lake County consist of the section beginning at the Klamath County line and extending southerly to Anna Springs, approximately 17 miles south of Silver Lake town, the next section of 11.02 miles being now under contract for grading with prospects of completion in the spring of 1929. The next section of 8.6 miles is graded and surfaced and connects with the Chalk Cliff-Paisley section, which has been graded but not yet surfaced. From Paisley to the California line the highway has been graded and partially surfaced, with the exception of a section of six miles south of Lakeview, which is still unimproved.

The last section of the Klamath Falls-Lakeview Highway in Lake County has been completed during its past biennium, the surfacing of the Lakeview-Drews Valley section having been completed during 1927,

All work which has previously been done in Lake County upon the Prineville-Lakeview Highway is now referred to as being upon the Fremont Highway, as the Highway Commission has renamed and revised this highway, making its northerly connection with The Dalles-California Highway near LaPine instead of routing via Fort Rock to the Central Oregon Highway near Millican, as originally contemplated. All state work within this county has been handled under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend.

West Forest Boundary-Drews Valley Forest Road Project

This project was begun during the previous biennium and a descriptive article will be found on page 343 of the last biennial report.

The project begins at the west Forest Boundary in Klamath County, approximately nine miles easterly from Bly, and extends east 11.7 miles into Lake County to the head of Drews Valley, where it connects with prior state highway construction. The improvement eliminates one of the worst sections on the Klamath Falls-Lakeview Highway. Being a forest road project, all of the work was handled under the direction of the Bureau of Public Roads.

The grading was constructed under a contract awarded to W. C. Elliott, who began operations early in the summer of 1926 and completed the contract in the fall of 1927.

The surfacing was under contract to Dunn & Baker of Klamath Falls, Oregon, who began their operations in the summer of 1927 and completed them early in the summer of 1928.

[LAKE]

The total expenditures to date have amounted to $249,508.96, consisting of $126,919.50 from state funds and $122,589.46 from government funds. The total estimated final cost is $249,939.01, of which the state is to cooperate to the extent of the amount mentioned above as having been paid and the federal government is to pay $123,019.51.

Chalk Cliff-Paisley Grading

Federal Aid Project No. 107-B

On the Fremont Highway, from Sta. 2909+82, which station is approximately 14 miles south of Summer Lake postoffice, to Sta. 2409+00, which station is approximately one-half mile north of the town of Paisley; 9.48 miles of grading.

Contract No. 971, awarded April 19, 1927, to John Hampshire, of Grants Pass, Oregon. Work commenced May 10, 1927; completed August 6, 1927. Estimated cost, $32,000. Resident Engineer, B. J. Crowley.

This section was for the most part across flat country, fairly easy to construct, and connects with improved sections on each end.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,966.43
Constructing temporary surfacing by state forces		4,909.61
Contract items as follows:		
Clearing and grubbing, all	$ 750.00	
Excavation, single classification, 54,321.9 cu. yds. at 24c	13,037.26	
Overhaul, 21,217.0 yd. sta. at 7c	1,485.19	
12-inch corrugated galvanized iron pipe, 402.0 lin. ft. at $1.40	562.80	
18-inch corrugated galvanized iron pipe, 1,404.0 lin. ft. at $2.50	3,510.00	
24-inch corrugated galvanized iron pipe, 348.0 lin ft. at $3.30	1,148.40	
30-inch corrugated galvanized iron pipe, 224.0 lin. ft. at $5.50	1,232.00	
36-inch corrugated galvanized iron pipe, 108.0 lin. ft. ta $6.50	702.00	
48-inch corrugated galvanized iron pipe, 100.0 lin. ft. at $10.50	1,050.00	
Force account items:		
Rip-rapping slopes at culvert inlets	100.61	
Extra cost of furnishing dipped culvert pipe	374.76	
Extra cost of special clamps for irrigation pipes	18.90	
Total amount paid to contractor		23,971.92
Grand total expended on project, 1927-28		$ 31,847.96

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended to date	Cr. $ 8,200.27	$23,971.92	$16,076.31	$31,847.96
Estimated cost to complete	14,132.23	Cr. 15,981.28	2,001.09	152.04
Total estimated costs	$ 5,931.96	$ 7,990.64	$18,077.40	$32,000.00

Drews Valley-Lakeview Surfacing

On the Klamath Falls-Lakeview Highway, from Sta. 1559+60, which station is at the west corporate limit of the town of Lakeview, to Sta. 710, which is approximately 16 miles west of Lakeview, and being the east end of the surfaced section of highway designated as the Drews Valley section; 16.09 miles of surfacing, being 18 feet in width and containing approximately 40 cubic yards of material per station.

Contract No. 916, awarded August 26, 1926, to Carl Nyberg, of Spokane, Washington. Work commenced October 23, 1926; completed August 20, 1927. Final cost, $76,373.15. Resident Engineer, B. J. Crowley.

[LAKE]

The work consisted of the surfacing of the above section, using broken stone material. The quarries were located, one six-tenths miles east of the east terminus of the project and one at Station 887.

Along with this contract there was incorporated by special agreement the surfacing of certain streets within the corporate limits of the town of Lakeview, said streets being a part of the state highway system. This was done on a cooperative basis with Lake County and amounted to $6,210.21. Cost statements for both divisions of the work follow.

DETAILED STATEMENT OF EXPENDITURES

Drews Valley-Lakeview Surfacing

Engineering		$ 5,128.50
Lease of Lakeview Water Company gravel pit		250.00
Sprinkling surfacing materials		2,805.28
Contract items as follows:		
Base course surfacing, 13,983.0 cu. yds. at $1.77	$24,749.91	
Top course surfacing, 17,968.5 cu. yds. at $1.80	32,343.30	
Maintenance materials, 3,203.0 cu. yds. at $1.10	3,523.30	
Hauling maintenance materials, 4,296.0 yd. mi. at 18c	773.28	
Earth filler, 13,151.0 cu. yds. at 25c	3,287.75	
Filler haul, 16,548.5 yd. mi. at 18c	2,978.73	
Hauling rejected materials, 753.75 yd. mi. at 18c	135.68	
Force account items:		
Digging drainage ditches where required	230.62	
Clearing and grubbing filler pit sites	166.80	
Total amount paid to contractor		68,189.37
Grand total cost of project, all state funds		$ 76,373.15

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 992.26
Expended 1927-28 biennium	75,380.89
Total	$76,373.15

Surfacing Streets in City of Lakeview

Engineering		$ 616.74
Labor and materials furnished by the state:		
Constructing Deadman Creek Bridge		600.97
Hauling and placing surfacing materials in 1928		682.15
Sprinkling surfacing materials		99.23
Contract items as follows:		
Broken stone top course, 1,543.5 cu. yds. at $1.80	$ 2,778.30	
Materials in stock piles, 943.4 cu. yds. at $1.10	1,037.74	
Stock pile material haul, 943 yd. mi. at 18c	169.74	
Earth cushion, 435.5 cu. yds. at 25c	108.88	
Earth cushion haul, 647 yd. mi. at 18c	116.46	
Total amount paid to contractor		4,211.12
Grand total cost of project, 1927-28		$ 6,210.21

PARTICIPATION IN COST

	State	*County*	*Total*
Total expended to date	$4,489.81	$1,720.40	$ 6,210.21
Estimated balances to complete	Cr. 684.36	684.36	.....
Estimated total costs	$3,805.45	$2,404.76	$ 6,210.21

Ana Spring-Hunter Hill Grading

Federal Aid Project No. 107C-136A

On the Fremont Highway, from Sta. 4120+00, which station is about 17 miles south of the town of Silver Lake, to Sta. 3403+00, which station is approximately 19 miles north of the town of Paisley; 11.02 miles of grading.

[LAKE]

Contract No. 1,047, awarded July 10, 1928, to Henry C. Boyer, of Ontario, Oregon. Work commenced July 27, 1928. Estimated cost, $46,000, being $18,390.89 from state funds and $27,609.11 from government funds. Expenditures to date, $14,139.82, being $10,718.04 from state funds and $3,421.78 from government funds. Resident Engineer, B. J. Crowley.

The work has proceeded very satisfactorily to date, being approximately 65 per cent complete as to volume and approximately 60 per cent complete as to mileage. It is expected that the project will be complete by early spring, 1929.

Maintenance

The maintenance work within this county during the biennium consisted of the maintenance of the Lakeview-Klamath County line section of the Klamath Falls-Lakeview Highway, the nine mile section of macadam along Summer Lake, the 10.87 miles of earth road on the Chalk Cliff-Paisley section, upon which a temporary surfacing has been added, the 46 miles of macadam surfacing between Paisley and Lakeview, and two short sections of 5.7 miles of improved highway and 3.5 miles of graded road south of Lakeview. This work has been handled by two general patrol crews, one stationed at Paisley and one at Lakeview. The maintenance consisted of the usual blading and dragging the macadam and the addition of maintenance materials from time to time.

The minor betterments consisted of the addition of surfacing materials where needed to stabilize the roadway and the surfacing of one section of 1.1 miles of old county road in Crooked Valley, approximately 12 miles north of Lakeview, which has been taken over by the state as a part of the state highway system and which was revamped by state forces and placed in good condition for travel.

Considerable expense was occasioned due to snow conditions but all highways in the county have been kept open at all times without much inconvenience to traffic.

The work in this county has been handled by Resident Maintenance Engineer B. J. Crowley, located at Lakeview.

Chandler Park Development

This consisted of the survey for and acquiring of approximately 61 acres of land lying along the Fremont Highway and Crooked Creek in section 31, township 36 south, range 21 east, Lake County. This tract is adjacent to and north of the present 2.2 acre park which was acquired previously. This additional park property was given to the state by Mr. S. B. Chandler and wife.

There has been no development or expense in connection with this park other than the cost of the survey.

Hunter Hill-Picture Rock Pass Survey

This is a relocation survey made to improve the alignment and grades over a section which was located a number of years ago, and which did not conform to the present day standards.

It was possible to use the original maps for the purpose of making projections, and the new alignment was platted on the same map.

[LAKE]

Picture Rock Pass-Lapine Survey

The Fremont Highway as adopted by the Highway Commission consists of a portion of the original Prineville-Lakeview Highway from Lakeview to a point north of Silver Lake, and extends northwesterly to a junction point with The Dalles-California Highway south of Lapine.

The survey consisted of a located line beginning at the westerly end, near Lapine, and extending to Picture Rock Pass. A considerable amount of time was spent on reconnaissance, and several alternate lines were investigated for use in choosing the most feasible route. Most of the line was located direct, a preliminary line being unnecessary.

Valley Falls-Harney County Line Survey

This survey consists of a preliminary line starting at Valley Falls and extending northeasterly to a connection with the Central Oregon Highway near the Gap Ranch.

The survey was made at the request of Lake and Harney counties, and is being paid for by them. It is expected that the field work of the survey will be completed about November 15, and the estimated cost will be approximately $36 per mile.

LANE COUNTY

Construction work on the state highway system during the 1927-1928 biennium has not been as active in Lane County as in times past, although several units have been completed or are under way.

On the Willamette Highway between Lowell and Black Canyon three grading projects are completed or are under way at the present time, being the West Unit of the Lowell-Goodman Creek section, upon which the grading is 80 per cent complete; the East Unit of the Lowell-Goodman Creek section, upon which the grading is completed; and the Goodman Creek-Black Canyon section upon which the grading is being carried on by the U. S. Bureau of Public Roads, Forest Road Department, is 50 per cent complete. It is planned that a surfacing project covering two or more of these sections on the Willamette Highway will be begun early in 1929, as will probably an additional grading unit above Black Canyon toward Oakridge.

No construction work has been done on the Siuslaw Highway because Lane County was unable to finance its part of the construction cost due to the fact that the 1927 millage levy voted by the people of Lane County was found to be unconstitutional, and due to the further fact that a change in the route of the Siuslaw Highway from the north fork route, as previously planned, to the present adopted route down the main Siuslaw River, necessitated encroachment negotiations with the Southern Pacific Railroad Company. These negotiations have been very slow to materialize.

At this time the U. S. Bureau of Public Roads has practically completed the field work on the final location surveys and encroachment arrangements are being negotiated with the Southern Pacific Company preparatory to construction work which is planned for 1929 and which Lane County has authorized by the passage of a tax levy providing some $80,000 or $100,000 as Lane County's share of cooperation.

No new construction work has been done on the Roosevelt Coast Highway across Lane County during the past biennium.

All state construction work, except major bridge construction, in Lane County has been handled under the direct supervision of J. S. Sawyer, Division Engineer, Salem, Oregon.

Harrisburg-Junction City Paving

Federal Aid Project No. 105-B

On the Pacific Highway, from Sta. 1352+00, which station is 412 feet north of the north corporate limits of Harrisburg, south to Sta. 1614+35.5, which station is at the intersection of Ivy and Sixth streets in Junction City, except that portion between Sta. 1400+00 and Sta. 1433+60; 4.2 miles of concrete paving, 18 feet wide, seven inches thick at center and nine inches thick at the edges, increased thickness being obtained in the last three feet of the outer edges. Gravel shoulders three feet wide on both sides.

Contract No. 785, awarded March 26, 1925, to George W. Read, of Eugene, Oregon. Work commenced April 13, 1925; completed October 20, 1925. Final cost, $130,625.53. Resident Engineer, Melville Jones.

[LANE]

This project has been opened during the present biennium only to record the receipt of $2,342.44 in the final payment of the cooperative share of Junction City. The final cost now consists of $49,181.57 from state funds, $3,560.55 from city of Harrisburg funds, $3,342.44 from city of Junction City funds, and $74,540.97 from government funds.

Further details will be found on page 346 of the 1925-26 report.

Sutton Lake-Florence Grading

On the Roosevelt Coast Highway, from Sta. 0+00, which station is at the intersection of Front and Washington streets in the town of Florence, north to Sta. 323+78, which station is at the crossing of the outlet to Sutton Lake; 6.15 miles of grading, class "A" 28-foot standard roadbed.

Contract No. 846, awarded August 27, 1925, to Baker & Scharschmidt, of Portland, Oregon. Work commenced September 5, 1925; completed September 30, 1926. Final cost, $64,863.27. Resident Engineer, Glenn E. Roberts.

Further details will be found on page 352 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 7,345.03
Surfacing in City of Florence		1,484.63
Royalty paid for clay topping material		72.25
Rental of state equipment furnished to the contractor		50.00
Contract items as follows:		
Clearing and grubbing, all	$ 5,500.00	
Excavation, single classification, 86,874.3 cu. yds. at 24½c	21,284.20	
Overhaul, 66,865.0 yd. sta. at 3c	2,005.95	
18-inch concrete pipe, 1,032.0 lin. ft. at $2.75	2,838.00	
24-inch concrete pipe, 258.0 lin. ft. at $3.75	967.50	
24-inch concrete pipe (not installed) 18.0 lin. ft. at $2.50	45.00	
36-inch concrete pipe, 44.0 lin. ft. at $3.75	352.00	
Clay topping, 14,648.5 cu. yds. at $1.50	21,972.75	
Force account items:		
Erecting wooden bulkhead to protect property in Florence	297.48	
Furnishing and spreading crushed gravel, Station 19+50 to 25+00	389.50	
Clearing outside of right-of-way for drainage ditches	308.98	
Total amount earned by contractor	$55,961.36	
Deduction for rental of equipment furnished by the state	50.00	
Total amount paid to contractor		55,911.36
Grand total cost of project		$ 64,863.27

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$35,657.42	$27,980.68	$ 63,638.10
Expended 1927-28 biennium	469.42	755.75	1,225.17
Total of expenditures	$36,126.84	$28,736.43	$ 64,863.27

Goodman Creek Forest Road Grading

This section of the Willamette Highway begins at Goodman Creek at the easterly terminus of the work being handled by the state highway department and extends easterly for a distance of 5.54 miles. The construction is being handled under a contract awarded by the Bureau of Public Roads to Kelly and Sullivan of Portland, Oregon.

[LANE]

Work on the project began during the summer of 1928, and at the present time is approximately 30 per cent complete. The original length of the project was 4.6 miles, but upon award of the contract it was found that there were sufficient funds available under the original allocation to extend the project to include the mileage noted above.

The estimated cost of the work is $112,500, towards which the county is to cooperate to the extent of $37,500 and the government is to pay the balance. Expenditures to date amount to $29,254.87 consisting of $10,000 from county funds and $19,254.87 from government funds.

Portage Section Forest Road Project

This project carried over from the previous biennium, and a descriptive article will be found on page 352 of the last report. No work has been done on the project since that time.

A total of 2.2 miles of the project was constructed as a forest road highway. At that time the project was withdrawn from the forest highway system on account of the fact that it was decided that the route of the Willamette Valley Florence Highway should be down the main Siuslaw River. The remainder of the project was then taken over by the county for construction as market road work.

Total reported expenditures on the project amount to $40,076.69, consisting of $10,000 from county funds and $30,076.69 from government funds.

West Unit, Lowell-Goodman Creek Grading

On the Willamette Highway, from Sta. 0—04.1, which station is near the Lowell Bridge, east to Sta. 213+00, which station is approximately four miles east of Lowell Bridge; 3.92 miles of grading, class "A" 24-foot standard roadbed.

Contract No. 999, awarded September 27, 1927, to Baker & Scharschmidt, of Portland, Oregon. Work commenced October 17, 1927. Estimated cost, $64,000. Resident Engineer, H. W. Libby.

As will be noted above, this contract was awarded to Baker & Scharschmidt of Portland, Oregon, in October, 1927, and shortly thereafter these contractors moved onto the job and started their clearing and grubbing operations and the installation of culverts. This work was carried on well into the winter, until heavy storms made further construction work difficult, when the crew was pulled off. About the middle of March, 1928, the contractors again resumed operations, but shortly thereafter found themselves in financial difficulty and the job was taken over for completion by the bondsmen, the Aetna Casualty & Surety Company, on May 23, 1928.

Following the taking over of the job, which was then about 20 per cent complete, the bondsmen employed Washburn & Hall, contractors of Portland, Oregon, to complete the work. Washburn & Hall moved onto the job at once, commencing operations on June 11, and carried on the work at a fair rate of progress until the early fall rains forced them to cease operations.

[LANE]

The time limit on this contract has expired, but due to the delay caused by the financial difficulty of the first contractor and the loss of time, the bondsmen and the second contractors have been unable to complete the work on time. It is expected that the grading work on this project can be finished within a short time in the spring of 1929, at a date early enough to permit the surfacing of the project during that season.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,803.71
Contract items as follows:		
Clearing and grubbing, 98 per cent of total	$ 7,840.00	
Common excavation, 35,389.0 cu. yds. at 38c	13,447.82	
Intermediate excavation, 26,200.0 cu. yds. at 48c	12,576.00	
Solid rock excavation, 14,767.0 cu. yds. at 78c	11,518.26	
Overhaul, 109,390.0 yd. sta. at 3c	3,281.70	
18-inch concrete pipe, 894.0 lin. ft. at $2.50	2,235.00	
24-inch concrete pipe, 345.0 lin. ft. at $3.50	1,207.50	
30-inch concrete pipe, 282.0 lin. ft. at $5.00	1,410.00	
Lumber and timber, 28.0 M-FBM at $48.00	1,344.00	
Class "B" concrete, 9.71 cu. yds. at $25.00	242.75	
12-inch concrete pipe on hand, 48.0 lin. ft. at 75c	36.00	
Force account items:		
Extra clearing and grubbing outside right of way	362.84	
Total amount earned by contractor	$55,501.87	
Less retained percentage	7,631.88	
Total amount paid to contractor		47,869.99
Grand total expended on project, 1927-28		$ 50,673.70

PARTICIPATION IN COST

	State	*County*	*Total*
Expended to date	$ 2,803.71	$47,869.99	$50,673.70
Estimated cost to complete	41,196.29	Cr. 27,869.99	13,326.30
Total estimated costs	$44,000.00	$20,000.00	$64,000.00

East Unit, Lowell-Goodman Creek Grading

On the Willamette Highway, from Sta. 213+00, which station is approximately four miles east of the town of Lowell, east to Sta. 397+35, which station is at Goodman Creek; 3.49 miles of grading, class "A" 24-foot standard roadbed.

Contract No. 1,009, awarded October 25, 1927, to von der Hellen & Pierson, of Medford, Oregon. Work commenced December 24, 1927; completed October 20, 1928. Estimated cost, $148,000. Resident Engineer, H. W. Libby.

Bids on this project were received by the commission at the October, 1927, meeting and the award was made to Moon Brothers of Portland, who failed to sign their contract and forfeited their bid bond amounting to $5,444.50. The award was later made to the next lowest bidder, von der Hellen & Pierson, Medford, Oregon. These contractors moved onto the job immediately and did a considerable amount of their clearing and grubbing work in the winter of 1927-1928. As early in the spring of 1928 as weather conditions would permit von der Hellen & Pierson equipped their job with two power shovels, caterpillar tractors and graders and rushed the job through to an early completion before the wet weather set in.

[LANE]

Particularly interesting features of the work on this section were the construction of a cement rubble retaining wall, approximately 300 feet in length about midway of the job, built to retain the embankment of the highway which follows very closely the south shore of the Willamette River; also the extremely heavy solid rock excavation that was required where the line followed a steep bluff with almost a vertical slope to the river and where the entire roadbed had to be blasted from the solid rock.

As an item for future consideration, this solid rock cut opened up what appears to be a very fine quarry site that can be readily used for surfacing operations if needed.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,453.92
Contract items as follows:		
Clearing and grubbing, all	$12,000.00	
Common excavation, 56,497.3 cu. yds. at 40c	22,598.92	
Intermediate excavation, 40,743.3 cu. yds. at 40c	16,297.32	
Solid rock excavation, 92,925.0 cu. yds. at 75c	69,693.75	
Overhaul, 182,539.0 yd. Sta. at 3c	5,476.17	
Class "A" concrete, 121.87 cu. yds. at $24.00	2,924.88	
Class "B" concrete, 22.44 cu. yds. at $24.00	538.56	
Cement rubble masonry, 475.71 cu. yds. at $10.00	4,757.10	
Rock backfill, 2.7 cu. yds. at $2.00	5.40	
Metal reinforcement, 12,506.7 lbs. at 7c	875.47	
Lumber and timber, 62.032 M-FBM at $55.00	3,411.76	
6-inch porous drain tile, 80.0 lin. ft. at 40c	32.00	
12-inch concrete pipe, 51.0 lin. ft. at $1.50	76.50	
18-inch concrete pipe, 714.0 lin. ft. at $2.50	1,785.00	
24-inch concrete pipe, 207.0 lin. ft. at $3.50	724.50	
30-inch concrete pipe, 177.0 lin. ft. at $5.00	885.00	
Force account items:		
Setting anchor bars in rock foundation for box culvert, Sta. 336+80	25.02	
Extra clearing and grubbing outside limits of right of way	1,030.77	
Purchase of galvanized water pipe to replace pipe taken up in construction	13.23	
Total amount earned by contractor	$143,151.35	
Less retained percentage	4,294.54	
Total amount paid to contractor		138,856.81
Grand total expended, 1927-28		$143,310.73

PARTICIPATION IN COST

	State	*County*	*Total*
Expended to date	$ 4,453.92	$138,856.81	$143,310.73
Estimated cost to complete	95,546.08	Cr. 90,856.81	4,689.27
Total estimated costs	$100,000.00	$ 48,000.00	$148,000.00

Willamette River Bridge at Harrisburg

Federal Aid Project No. 105-A

On the Pacific Highway, at Harrisburg; three 108-foot steel spans, 88 19-foot spans of pile trestle.

Contract No. 738, awarded May 29, 1924, to Portland Bridge Company, of Portland, Oregon. Work commenced July 26, 1924; completed January 22, 1926. Final cost, $201,176.64. Resident Engineer, O. A. Chase.

[LANE]

This project has been held open during the present biennium only in order to record the final expenditures on the work.

Further details will be found on page 353 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 9,566.98
Labor and materials furnished by the state:		
Bronze name plates		182.50
Extra length drain pipe on steel span		91.19
Clearing right-of-way for trestle approach		225.49
Royalty for borrow material used in constructing approach fill under contract 785		400.00
Laying bituminous pavement on deck of approach trestle		6,700.05
Seal coat paint for waterproofing top of piers		34.87
Gravel placed on approach fill to Morris property		152.00
Rental of state equipment furnished to contractor		778.44
Contract items as follows:		
Excavation below 292-foot elevation, 1,769.0 cu. yds. at $6.00	$ 10,614.00	
Excavation above 292-foot elevation, 540.0 cu. yds. at $4.00	2,160.00	
Excavation below plan elevation, 84.0 cu. yds. at $7.00	588.00	
Class "B" concrete, 1,157.3 cu. yds. at $20.00	23,146.00	
Class "D" concrete, 350.7 cu. yds. at $20.00	7,014.00	
Metal reinforcement, 98,865.0 lbs. at 6c	5,811.90	
Structural steel, 856,895.0 lbs. at 7.6c	65,124.02	
Trestle superstructure, 1,672.0 lin. ft. at $16.00	26,752.00	
Lumber, 72.931 M-FBM at $60.00	4,375.86	
Fir piling, 6,449.0 lin. ft. at 50c	3,224.50	
Cedar piling, 11,497.0 lin. ft. at 70c	8,047.90	
Revetment piling, 5,100.0 lin. ft. at 70c	3,570.00	
Fascines, 203.33⅓ cords at $20.00	4,066.66	
Rock fill, 1,658.0 cu. yds. at $8.00	13,264.00	
Slope paving, 4,000.0 sq. yds. at $1.00	4,000.00	
Force account items:		
Repiling cedar decking to allow drying out	421.41	
Anchoring revetment piling to protect channel	529.95	
Furnishing and installing water stops	397.63	
Substituting Port Orford cedar decking for fir	1,155.83	
Total amount earned by contractor	$184,263.66	
Deductions:		
Rental of state-owned equipment	778.44	
Cement adjustment, 122.25 bbls. at $3.60	440.10	
Total amount paid to contractor		183,045.12
Grand total cost of structure		$201,176.64

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1923-24 biennium	$ 14,378.50	$ 4,409.37	$	$ 18,787.87
Expended 1925-26 biennium	Cr. 8,995.64	106,870.07	67,627.56	165,501.99
Expended 1927-28 biennium	Cr. 50,077.28	11,067.71	55,896.35	16,886.78
Total of expenditures	Cr.$ 44,694.42	$122,347.15	$123,523.91	$201,176.64

Bridge Over Willamette River at Springfield

Federal Aid Project No. 117-B

On the McKenzie River Highway, at Springfield; three 50-foot concrete spans, one 550-foot steel span continuous over four supports, four 50-foot and one 40-foot concrete spans.

Contract No. 1,033, awarded March 27, 1928, to Lindstrom & Feigenson, of Portland, Oregon. Work commenced April 18, 1928; completed October 31, 1928. Estimated cost, $146,000. Resident Engineers, Marshall Dresser and R. G. Barnes.

[LANE]

This structure is the largest bridge built during the biennium. Three steel spans continuous over the four piers constitute the central portion. These are flanked by concrete viaduct at each end. The roadway is 27 feet wide with a sidewalk at each side. Due to dispute with local property owners over the approach fills, the bridge has not yet been open to traffic.

This job is completed, but final settlement had not been made at the end of the biennium.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5,415.75
Labor and materials furnished by state:		
Transcript of Public Service Commission proceedings		87.75
Electrical conduits and fittings		231.03
Making test soundings		152.27
Contract items as follows:		
Excavation, 572.32 cu. yds. at $3.00	$ 1,716.96	
Excavation below plan elevation, 32.7 cu. yds. at $5.00	163.50	
Class "A" concrete, 518.89 cu. yds. at $21.50	11,156.14	
Class "B" concrete, 393.20 cu. yds. at $18.00	7,077.60	
Class "D" concrete, 816.77 cu. yds. at $20.00	16,335.40	
Metal reinforcement, 317,710.0 lbs. at $3.75	11,914.12	
Structural steel, 909,598.0 lbs. at 6.5c	59,123.87	
Concrete handrail, 1,714.84 lin. ft. at $5.00	8,574.20	
Additional items under special agreements:		
Excavation, 52.27 cu. yds. at $2.70	141.13	
Excavation below plan elevation, 3.13 cu. yds. at $4.50	14.09	
Class "A" concrete, 151.83 cu. yds. at $19.35	2,937.91	
Class "D" concrete, 101.29 cu. yds. at $18.00	1,823.22	
Metal reinforcement, 46,039.0 lbs. at 3.375c	1,553.82	
Concrete handrail, 180.0 lin. ft. at $4.50	810.00	
Weephole pipe, 27 each at $2.50	67.50	
Bondex finish, 265.42 sq. yds. at $2.25	597.20	
Total amount earned by contractor	$124,006.66	
Deductions:		
Cement adjustment, under-run	612.25	
Retained percentage and vouchers in process of payment	24,357.41	
Total amount paid to contractor		99,037.00
Grand total expended on structure, 1927-28		$104,923.80

PARTICIPATION IN COST

		State	*County*	*Government*	*Total*
Expended to date	Cr.	$ 3,277.22	$ 42,716.62	$ 65,484.40	$104,923.80
Estimated cost to complete	Cr.	2,891.45	22,283.38	21,684.27	41,076.20
Total estimated costs	Cr.	$ 6,168.67	$ 65,000.00	$ 87,168.67	$146,000.00

Blue River Bridge

Federal Aid Project No. 117-C

On the McKenzie River Highway, at Blue River; one 20-foot, three 60-foot and one 20-foot concrete spans continuous over all supports.

Contract No. 1,005, awarded September 27, 1927, to E. R. Metzger, of Roseburg, Oregon. Work commenced October 27, 1927; completed July 15, 1928. Estimated cost, $19,000. Resident Engineer, Marshall Dresser.

This bridge replaces a light timber truss. The site is one of the beauty spots of the McKenzie River Highway, and the bridge has been made to harmonize with its settings.

This job is complete, but final settlement had not been made at the end of the biennium.

[LANE]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,368.09
Labor and materials furnished by state:		
Royalties on gravel		15.70
Signs for control of traffic		10.80
Bronze name plates		31.88
Constructing approach fill		2,681.06
Constructing surfacing on approach fill		362.65
Contract items as follows:		
Excavation, 60.0 cu. yds. at $1.50	$ 90.00	
Excavation below plan elevation, 150.0 cu. yds. at $2.00	300.00	
Class "A" concrete, 250.0 cu. yds. at $23.00	5,750.00	
Class "D" concrete, 160.0 cu. yds. at $22.00	3,520.00	
Metal reinforcement, 84,000.0 lbs. at 4.5c	3,780.00	
Total amount earned by contractor	$ 13,440.00	
Less retained percentage	1,521.09	
Total amount paid to contractor		11,918.91
Grand total expended on structure, 1927-28		$ 17,389.09

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Total expended to date	$ 6,669.71	$ 2,817.38	$ 7,902.00	$17,389.09
Estimated cost to complete	Cr. 3,650.41	1,682.62	3,578.70	1,610.91
Estimated total costs	$ 3,019.30	$ 4,500.00	$11,480.70	$19,000.00

Deadwood Creek Bridge

On the Siuslaw Highway, near Swisshome; two 100-foot steel spans. Contract No. 984, awarded June 23, 1927, to D. T. Eaton Construction Company, of Portland, Oregon. Work commenced July 11, 1927; completed May 21, 1928. Final cost, $32,989.20. Resident Engineer, R. G. Barnes.

This structure replaces a light timber truss and eliminates two sharp curves, one at each end of the old bridge.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,226.10
Labor and materials furnished by state:		
Widening approach fill and constructing surfacing		650.35
Crushed rock for surfacing approaches		1,110.00
Providing detour road		35.60
Bronze name plates		32.00
Contract items as follows:		
Excavation to plan elevation, 391.2 cu. yds. at $2.40	$ 938.88	
Excavation below elevation, 1.5 cu. yds. at $3.00	4.50	
Class "A" concrete, 124.07 cu. yds. at $20.95	2,599.27	
Class "B" concrete, 43.57 cu. yds. at $19.95	869.22	
Class "D" concrete, 141.80 cu. yds. at $21.95	3,112.51	
Metal reinforcement, 47,057.0 lbs. at 4.75c	2,235.21	
Structural steel, 207,740.0 lbs. at 7.3c	15,165.02	
Approach fill, 4,869.2 cu. yds. at 75c	3,651.90	
Force account items:		
Raising approach of old bridge to maintain traffic	115.85	
Installing copper water-stops at expansion joints	254.10	
Total amount earned by contractor	$ 28,946.46	
Deduction for cement adjustment	11.31	
Total amount paid to contractor		28,935.15
Grand total cost of structure, 1927-28		$ 32,989.20

PARTICIPATION IN COST

State	$ 25,308.86
County	7,680.34
Total	$ 32,989.20

[LANE]

Maintenance and Betterment

All maintenance and betterment work on the completed state highway system in Lane County, which has been constructed to state standard line and grade, consisting of the general maintenance of roadbed, drainage, shoulders, surfaces, rights of way, etc., has been carried on under the direction of J. S. Sawyer, Division Engineer, with headquarters at Salem, Oregon, and Raymond Walsh, Resident Engineer, Eugene, Oregon.

Under the head of betterment work in Lane County the following projects have been completed:

Siuslaw Highway, additional feed rock or light resurfacing from a point four miles west of Cheshire to the summit of the Coast Range, a distance of about 12 miles, and the widening of approximately three miles of the grade; on the Pacific Highway, the widening of a short stretch of the highway about one mile south of Goshen, known locally as Camas Swale; on the McKenzie Highway, the oiling and reoiling of the Springfield-Thurston section, which was oiled with light oil in the summer of 1927 and in 1928 reoiled about one-half the distance with light oil and the balance with heavy oil treatment; on the Willamette Highway, the oiling of the Goshen-Lowell section, eight miles in length, with light oil treatment.

Park Site at the Lane-Benton County Line

Expenditures this biennium have covered a limited amount of maintenance and betterment work such as the slashing and clearing of underbrush and the usual routine maintenance, such as policing and cleaning up debris left by campers. These have amounted to $279.58.

A further descriptive article will be found on page 358 of the 1925-26 report.

Maintenance Headquarters Site at Goldson

In order to more conveniently carry on the maintenance operations on the Cheshire to Triangle Lake section of the Siuslaw Highway, it was decided to purchase a 3.47 acre tract located adjacent to the Siuslaw Highway in section 27, T. 16 S., R. 6 W., W. M., approximately seven miles east of Blachly, from Mrs. E. J. Kubli, at the modest purchase price of $1.

Since the purchase of the tract there has been constructed a three bay maintenance headquarters building, which work was done under the direction of the bridge department and Raymond Walsh, Resident Engineer, Eugene, Oregon.

In connection with the operation of the above mentioned maintenance headquarters a permanent easement across the property of J. C. Hise for a distance of approximately one mile, which permits the construction and maintenance of a water pipe line to serve the headquarters station, was secured for the cost of installation of a three-quarter inch service pipe to the home of J. C. Hise, which installation has been made at a cost of approximately $50.

Total expenditures have amounted to $4,881.12 from state funds.

[LANE]

Low Pass Summit-Goldson Maintenance Materials

On the Siuslaw Highway, from Sta. 522+00, which station is approximately four miles west of Cheshire, west to Sta. 1036+00, which station is at the summit of the Coast Range Mountains about three miles east of Blachly; 16,128 cubic yards of broken stone maintenance material in stock piles.

Contract No. 986, awarded July 28, 1927, to S. Simonsen, of Portland, Oregon. Work commenced August 12, 1927; completed June 29, 1928. Final cost, $31,635.61. Resident Engineer, Raymond Walsh.

The specifications for this project contemplated two alternate sources of material, described as source No. 1, the Kubli quarry, which was an old, proven quarry, and source No. 2, a new, undeveloped site which preliminary investigations indicated as a very good prospect.

The contractor elected to secure his material from source No. 2, which had been previously acquired by the state, but on moving onto the job and beginning the work of driving coyotes and shooting the quarry, it developed the quantity of rock available at this site was not sufficient. Arrangements were then made with the contractor to reimburse him for the loss sustained in attempting to operate site No. 2 and he transferred his operations to the old Kubli quarry site where the entire rock for the project was produced.

The nature of the work done under this contract was the production of maintenance rock stock piled along the road for use in future oiling and maintenance work, and while stock piling the material for future use the contractor was required to place approximately 9,736 cubic yards of material on the road.

Detailed Statement of Expenditures

Engineering		$ 1,305.15
Lease of Kubli quarry		1,100.00
Prospecting for surfacing materials		160.91
Reconstructing surfacing by state forces		927.71
Preparing stock pile sites		186.21
Credit for materials stock-piled for betterment work		Cr. 11,012.00
Contract items as follows:		
Grade "A" broken stone, 3,308.5 cu. yds. at $2.10	$ 6,947.85	
Grade "B" broken stone, 3,094.0 cu. yds. at $1.90	5,878.60	
Grade "C" broken stone, 4,713.5 cu. yds. at $1.70	8,012.95	
Grade "D" broken stone, 5,012.0 cu. yds. at $1.40	7,016.80	
Hauling broken stone, 53,059.75 yd. mi. at 18c	9,550.76	
Excavation, 800.0 cu. yds. at $1.00	800.00	
Force account items:		
Preparing stock pile sites	248.46	
Prospecting for rock at Source No. 2	512.21	
Total amount paid to contractor		38,967.63
Grand total cost of project, all state funds, 1927-28		$ 31,635.61

DETAIL OF BETTERMENT ITEMS TRANSFERRED

Grade "A" broken stone, 1,400.0 cu. yds. at $2.10	$ 2,940.00
Grade "B" broken stone, 1,500.0 cu. yds. at $1.90	2,850.00
Grade "C" broken stone, 2,500.0 cu. yds. at $1.70	4,250.00
Hauling broken stone, 5,400.0 yd. mi. at 18c	972.00
Total	$ 11,012.00

[LANE]

Harrisburg Revetment

On the Pacific Highway, at Harrisburg.

This work, which was done by state forces in conjunction with contracts Nos. 885 and 911, was completed prior to November 30, 1926, but final payment had not been made at that time.

The final cost now represents a total expenditure of $69,319.99, as shown by the detailed cost statements given below.

Further details will be found on page 355 of the 1925-26 report.

Detailed Statement of Expenditures

Contract No. 826		
Engineering		$ 351.01
Fascines placed by state forces		13,431.12
Contract items as follows:		
Piling, 19,612.0 lin. ft. at 50c	$ 9,806.00	
Lumber, 23.716 M-FBM at $50.00	1,185.80	
Piling left on hand, 210.0 lin. ft. at 10.5c	22.05	
Force account items:		
Furnishing cable and tying piling together to form dolphins	32.60	
Total amount paid to contractor		11,046.45
Grand total cost of structure, 1925-26		$ 24,828.58
PARTICIPATION IN COST		
State	$ 10,364.14	
Lane County	7,232.22	
Linn County	7,232.22	
Total	$ 24,828.58	
Contract No. 885		
Engineering		$ 609.90
Labor and materials furnished by state:		
Filling in fascines and rock between piling		22,511.44
Planting willows for bank protection and repairing revetments in 1927		5,063.22
Contract items as follows:		
Piling, 15,683.0 lin. ft. at 40c	$ 6,265.20	
Lumber, 12.221 M-FBM at $71.00	867.69	
Force account item:		
Removing old revetments where necessary to connect with new work	1,463.32	
Total amount paid to contractor		8,596.21
Grand total cost of structure, all state funds		$ 36,780.77
SEGREGATION OF COST		
Expended 1925-26 biennium	$ 31,717.55	
Expended 1927-28 biennium	5,063.22	
Total	$ 36,780.77	
Contract No. 911		
Engineering		$ 689.00
Contract items as follows:		
Riprap rock, 4,678.0 cu. yds. at $1.48	$ 6,923.44	
Force account items:		
Building truck road to quarry	45.20	
Quarrying and furnishing rock under one foot in diameter	53.00	
Total amount paid to contractor		7,021.64
Grand total cost of project, all state funds		$ 7,710.64
SEGREGATION OF FUNDS		
Expended 1925-26 biennium	$ 5,228.33	
Expended 1927-28 biennium	2,482.31	
Total	$ 7,710.64	

[LANE]

Florence-Douglas County Line Survey

The original location survey for this section of the Roosevelt Coast Highway was made some years ago and, as is usually the case, it has been found advisable to make a relocation survey in order to secure a straighter and better line.

The work on this survey has been carried on at various times with a small crew under the direction of Glenn E. Roberts, Resident Engineer, Gardiner, Oregon, which at the present time is working on the survey just north of the Lane-Douglas County line.

Springfield Lane-Cogswell Hill Survey

At the urgent request of the Lane County Court, the Eugene Chamber of Commerce and other interested citizens, the commission at the October, 1928, session indicated their willingness to make a relocation survey of the Springfield Lane-Cogswell Hill section of the McKenzie Highway. At the present time the preliminary lines have been run and it is expected that the final survey will be completed by January 1, 1929.

The route of the new survey will follow, as closely as it is possible to do so, the prolongation of the Springfield Lane tangent to Cogswell Hill. This line has the advantage over the present traveled route of being much straighter and shorter and being readily adaptable to the high type of construction necessary to such a highway as the McKenzie Highway.

Surveys on this project are being made under the direct supervision of Raymond Walsh, Resident Engineer, Eugene, Oregon, assisted by H. W. Libby, Resident Engineer, Lowell, Oregon.

Springfield-Blue River Gaps Survey

During the 1925-1926 biennium location surveys on the remaining unconstructed gaps on the McKenzie Highway between the east city limits of Springfield and Nimrod, totaling in all 23 miles, were practically completed. The charges shown on the books during the present biennium were for additional survey work necessary on account of revisions in the line proposed by the Eugene Water Board to accommodate their plan for hydro-electric development on the McKenzie.

Preliminary work on this location survey was done under the direction of Raymond Walsh, Resident Engineer, Eugene, Oregon, and the final location surveys were made under the direction of Glenn E. Roberts, Locating Engineer, Gardiner, Oregon.

Lowell-Crescent Forest Road Survey

This survey was originated in June, 1922, and was carried out as a preliminary survey under the direction of C. R. Short, Locating Engineer for the Bureau of Public Roads, who ran a preliminary line between Lowell and Crescent. In 1926 the state highway department made a projection and staked a location line from Lowell to Goodman Creek, which section has been placed under contract for construction by the state.

[LANE]

In 1927 the state made an additional location survey from Goodman to Black Canyon, approximately 5.5 miles, and this portion now has been placed under contract for construction by the bureau as a forest highway project. At the present time the bureau is engaged in making a location survey, extending on east into Black Canyon. The present contemplated length of the additional portion to be located is 3.5 miles, and will cover territory necessitating very heavy construction work.

The total estimated cost of the surveys made by the bureau is $33,867.38, consisting of $13,500 from state funds and $20,367.38 from government funds. The expenditures to date amount to $27,446.66, of which the state has paid $13,500 and the government has paid the balance of $13,946.66. No expenditures have been made from state funds during the present biennium.

Lowell-Oakridge Survey

Several years ago a preliminary survey of the Willamette Highway from Lowell to Crescent was made by the U. S. Bureau of Public Roads under the direction of Mr. Short, Locating Engineer, and in December, 1926, the location survey from Lowell to Black Canyon was ordered.

In compliance with this order and under direction of H. W. Libby, Locating Engineer, Lowell, Oregon, and using the U. S. Bureau of Public Roads' preliminary data, a location survey was run from the east end of the improved Goshen-Lowell section, which is about one and one-half miles west of Lowell Bridge, up along the south bank of the Willamette River a distance of 14.67 miles to Black Canyon, the survey being completed in May, 1927.

Cheshire-Junction City Survey

During February, 1928, under the direction of Carl A. Peterson, Resident Engineer, Corvallis, Oregon, a preliminary location survey of the Siuslaw Highway between Cheshire and Junction City was made.

This survey is in the nature of a relocation survey, the original location survey having been made some years ago, running straight east from Cheshire to an intersection with the Pacific Highway approximately two miles south of Junction City, whereas this survey takes a diagonal northeasterly course from the end of the present completed and macadamized section at the crossing of the Southern Pacific Railroad in Cheshire and connects with the West Side Pacific Highway at a point where that highway turns northward about three-quarter mile west (timecard north) of Junction City.

This preliminary location survey crosses the flood plain of the Long Tom River and its construction, if adopted, will necessitate the construction of a number of bridges and flood relief openings. During the 1927-1928 flood season accurate water measurements, current meter readings and other valuable high water data and information were secured and tabulated for future use in the design of the flood relief openings.

[LANE]

North Fork Mountain Survey

In the early part of September, 1926, a location party was sent into the field to make the final location of that portion of the Siuslaw Highway between the west end of the constructed Forest Road Section near Rainrock and the east end of the Portage section near Minerva.

This location survey and final construction plan was completed early in February, 1927, and at approximately the same date the United States Bureau of Public Roads, who were making a survey for the same highway on the main Siuslaw River route, completed their survey.

Shortly after that date the two routes were considered by a joint meeting of the Highway Commission and the United States Bureau of Public Roads, at which time the definite location of the Siuslaw Highway was chosen down the main river route from Rainrock to Florence, so that in all probability the North Fork Mountain survey will not be used for state highway work, but will be very useful to Lane County as a market and county road survey.

Field work on the North Fork Mountain survey was done under the direction of E. E. Umphlette, Locating Engineer, Swisshome, Oregon.

Portage Section Forest Road Survey

As stated in a previous article herein covering the Portage Section Forest Road Project, the project was abandoned by the bureau and was taken over by the county.

The total expenditures on the survey made by the government have amounted to $1,675.58 from government funds.

Florence-Rainrock Forest Road Survey

A preliminary survey on this project was made in January and February of 1927 by the Bureau of Public Roads. When a study of the data secured was made, it was decided to adopt the route surveyed as the official route for the Siuslaw Highway.

During the summer of 1928 the bureau made a location survey and data were taken in order to cover the required easement petitions for presentation to the Southern Pacific Railroad. Negotiations are now in progress for the securing of the right of way necessary to construct the project.

The estimated final cost of the two surveys is $15,594.54, of which the state is to pay $3,000 and the federal government $12,594.54. Expenditures to date have amounted to $13,405.79 of which the state has paid its full share of $3,000 and the federal government has expended $10,405.79.

LINCOLN COUNTY

During the 1927-1928 biennium the highway program in Lincoln County has made rapid advancement, the projects completed being as follows:

The final completion of the grading, bridges and surfacing of the Roosevelt Coast Highway from the Siletz River to Newport; the placing under contract of the Yaquina Bay-Seal Rocks section of the Roosevelt Coast Highway under the supervision of the U. S. Bureau of Public Roads; the negotiation and securing of rights of way for remaining portions of the Roosevelt Coast Highway as yet uncompleted from Seal Rocks south to the Lane County line.

Under the head of special maintenance and betterment work the oiling of the Otter Rock-Newport section of the Roosevelt Coast Highway, and the oiling of the Toledo-Newport section of the Corvallis-Newport Highway was done.

As a continuing plan it is proposed that an additional grading project on the Seal Rocks to Alsea Bay section of the Roosevelt Coast Highway be undertaken by the Bureau of Public Roads early in 1929 and that as a federal aid project the section from Waldport to Yachats on the Roosevelt Highway is planned.

Construction work on the state highway system in Lincoln County during the past biennium has been carried on in that section of the county lying north of the Siletz River by W. D. Clarke, Division Engineer, with headquarters at Salem, and for the remainder of Lincoln County under the direction of J. S. Sawyer, Division Engineer, with headquarters at Salem.

Siletz Bay-Otter Rock Surfacing

Federal Aid Project No. 110-C

On the Roosevelt Coast Highway, from Sta. 601+00, which station is approximately 300 feet north of the north end of the bridge over the Siletz River about two miles south of the town of Taft, south to Sta. 76+00, which station is at the junction with the road leading to Otter Rock postoffice, about eight miles north of Newport; 12.75 miles of broken stone surfacing, 1.76 miles of which was laid in four courses, two courses of sub-base material each three and five-tenths inches thick, one course of base material two and five-tenths inches thick, and one course of top material two and five-tenths inches thick; balance of 10.99 miles was laid in three courses; one course of sub-base material four inches thick, one course of base material two and five-tenths inches thick and one course of top material two and five-tenths inches thick, all half trenches.

Contract No. 957, awarded March 4, 1927, to Greenwood & Dann, of Portland, Oregon. Work commenced April 23, 1927; completed August 23, 1928. Final cost, $132,889.12. Resident engineers, W. W. Stiffler, Taft, Oregon, until March, 1927, and T. A. Rice, Newport, Oregon, from March, 1927, to completion of the job.

As will be noted above, the contract for this project was awarded in March, 1927, and it was contemplated that the contract would be completed during 1927; but due to the fact that the contractors were delayed

[LINCOLN]

in getting started on the project there was only completed, during the working season of 1927, the sub-base course from the Siletz River to Newport, over which traffic was carried during the winter, and the top courses from Otter Rock to Otter Crest. Work was suspended in November, 1927, but in the early spring of 1928 the contractors resumed operations and rushed the job through to completion in August, 1928.

An excellent quality of hard, basaltic rock was secured for the project from a quarry site located one mile north of Otter Crest and adjacent to the highway.

As originally specified this contract provided for crusher run maintenance materials, but during the progress of the work an agreement was reached with the contractor whereby the amount of maintenance material was increased by approximately 4,000 yards and the sizes changed to provide one and one-half inch to three-quarter inch clean crushed rock, three-quarter inch to one-half inch clean crushed rock and one-half inch to one-eighth inch clean crushed rock, which could be used for future maintenance work in connection with oiling operations. This arrangement increased the original price slightly, but the price was favorable to the state for the quality of rock secured.

In addition to the work specified under the contract an additional unit price agreement was entered into with the contractor whereby the deep thorough cut at the quarry was daylighted to provide a wide parking space on this prominent overlook from where an excellent view both north and south along the rugged coast line of Otter Crest is to be had.

Detailed Statement of Expenditures

Engineering		$ 5,862.64
Widening roadbed		57.02
Removing slides and repairing washouts		356.56
Constructing tile drains		14.40
Placing temporary surfacing to maintain winter travel		646.21
Hauling surfacing materials		105.25
Constructing detour road		29.88
Royalties on surfacing materials		20.00
Contract items as follows:		
Sub-base course surfacing, 15,941.0 cu. yds. at $2.10	$ 33,476.10	
Base course surfacing, 11,452.0 cu. yds. at $2.25	25,767.00	
Top course surfacing, 8,152.0 cu. yds. at $2.50	20,380.00	
1/2" to 1/8" maintenance materials, 4,202.5 cu. yds. at $1.66	6,976.15	
3/4" to 1/2" maintenance materials, 4,189.4 cu. yds. at $1.66	6,954.40	
1 1/2" to 3/4" maintenance materials, 1,903.2 cu. yds. at $1.46	2,778.67	
Hauling maintenance materials, 27,607.95 yd. mi. at 20c	5,521.59	
Earth filler, 8,908.0 cu. yds. at 45c	4,008.60	
Filler haul, 23,448.5 yd. mi. at 20c	4,689.70	
Stripping filler pits, 482.0 cu. yds. at 25c	120.50	
Common excavation, 6,459.8 cu. yds. at 50c	3,229.90	
Solid rock excavation, 1,591.4 cu. yds. at $1.50	2,387.10	
Excavation haul, 84.0 yd. mi. at 25c	21.00	
6-inch porous drain tile, 8,323.0 lin. ft. at 30c	2,496.90	
Rock back fill for drains, 1,025.8 cu. yds. at $3.00	3,077.40	
Excavation, Sta. 56 to 58, 2,802.0 cu. yds. at $1.00	2,802.00	
Earth cushion, 2,467.0 cu. yds. at 45c	1,110.15	
Total amount paid to contractor		125,797.16
Grand total cost of project, 1927-28		$132,889.12

PARTICIPATION IN COST

	State	*Government*	*Total*
Total expended to date	$132,889.12	$	$132,889.12
Estimated balances to complete Cr.	39,992.70	39,992.70	
Estimated total costs	$ 92,896.42	$ 39,992.70	$132,889.12

[LINCOLN]

Otter Rock-Newport Surfacing

On the Roosevelt Coast Highway, from Sta. 71+00, near Otter Rock, to the intersection of Cape and Sixth street in the town of Newport; 8.50 miles of crushed rock surfacing laid in three courses, one 4-inch course of 1½ crusher-run base rock and two 2-inch courses of three-quarter inch crusher-run top rock, 14 feet wide on top and feathered to 18 feet on the bottom.

Contract No. 809, awarded May 28, 1925, to Joslin & McAllister, of Spokane, Washington. Work commenced July 31, 1925; completed October 9, 1926. Final cost, $59,619.47. Resident Engineer, T. A. Rice.

Further details will be found on page 361 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,439.93
Purchase of quarry site approximately 3.21 acres		2,250.00
Signs provided by state for protection of traffic		36.00
Planking and processing surfacing materials by state forces		3,280.96
Credit by transfer account of resurfacing of Newport-Toledo section		Cr. 35,414.70
Contract items as follows:		
Base course surfacing, 11,789.0 cu. yds. at $2.05	$24,167.45	
Top course surfacing, 7,271.0 cu. yds. at $2.05	14,905.55	
Earth filler, 3,773.5 cu. yds. at 40c	1,509.40	
Filler payhaul, 7,447.5 yd. mi. at 25c	1,861.88	
Maintenance materials in stock piles at Agate Beach, 2,130.0 cu. yds. at $1.50	3,195.00	
Maintenance materials in stock piles at roadside, 2,870.0 cu. yds. at $1.35	3,874.50	
Additional maintenance materials in stock piles at roadside, 4,590.0 cu. yds. at $1.25	5,737.50	
Maintenance materials on road, 9,264.0 cu. yds. at $1.35	12,506.40	
Hauling maintenance materials, 91,348.0 yd. mi. at 20c	18,269.60	
Total amount paid to contractor		86,027.28
Grand total cost of project, all state funds		$59,619.47

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$57,079.31
Expended 1927-28 biennium	2,540.16
Total	$59,619.47

Unit 2, Alsea River Forest Road Project

This project has continued over from the prior biennium, and a descriptive article will be found on page 360 of the last report.

The surfacing of the final sections were completed during the summer and fall of 1927. This surfacing covered 16 miles and was constructed under a contract awarded by the Bureau of Public Roads to Joplin and Eldon of Portland. The materials used were crushed rock.

In addition to the surfacing by the Bureau of Public Roads, the state resurfaced the balance of the project with crushed gravel taken from a bar in the Alsea River. This work leaves the project in fairly satisfactory shape, although the sections earlier constructed are still deficient in width. The maintenance of the entire project is now under way by the Bureau of Public Roads.

Exclusive of the resurfacing work, the state has expended during the biennium an additional sum of $30,262.78 as cooperation on the forest road work. The total cost of the forest road project now stands at $307,262.78, of which the state has paid $154,262.78, the county $72,000, and the federal government $81,000. All sums advanced by the state in prior years to cover the county cooperative share now have been repaid.

[LINCOLN]

Siletz Bay-Rocky Creek Grading

Federal Aid Project No. 110-C

On the Roosevelt Coast Highway, from Sta. 555+90, near the south shore line of Siletz Bay and about three miles south of Taft, south to Sta. 91+50, approximately 500 feet north of the crossing of Rocky Creek and about 11 miles north of Newport; 8.97 miles of grading, class "A" 24-foot standard roadbed.

Contract No. 837, awarded July 28, 1925, to James Crick, of Pendleton, Oregon. Work commenced August 25, 1925; completed September 4, 1926. Final cost, $169,574.54. Resident Engineer, W. W. Stiffler.

This section of the Roosevelt Coast Highway traverses a rough, rugged, unsettled section, heavily timbered and difficult of access. In order to carry on the grading operations the contractor was compelled to use many different methods of transportation in getting supplies and materials, some of them coming by rail and then being hauled overland with horse teams, and others coming by boat.

As will be noted above this contract was completed in September, 1926, and so reported in the 1925-1926 biennial report, the books being held open during the present biennium to take care of delayed charges against the project.

Further details will be found on page 364 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 8,459.11
Signs provided by state for protection of traffic		9.56
Prospecting for surfacing materials by state forces		67.35
Contract items as follows:		
Clearing and grubbing, all	$ 17,000.00	
Common excavation, 106,753.3 cu. yds. at 40c	42,701.32	
Intermediate excavation, 49,239.6 cu. yds. at 50c	24,619.80	
Solid rock excavation, 49,633.8 cu. yds. at 90c	44,670.42	
Overhaul, 278,132.0 yd. sta.	8,343.96	
12-inch concrete pipe, 2,346.0 lin. ft. at $1.60	3,753.60	
18-inch concrete pipe, 1,239.0 lin. ft. at $2.75	3,407.25	
24-inch concrete pipe, 714.0 lin. ft. at $4.00	2,856.00	
36-inch concrete pipe, 420.0 lin. ft. at $9.00	3,780.00	
12-inch concrete pipe on hand, 30.0 lin. ft. at $1.40	42.00	
Lumber and timber, 44.910 M-FBM at $75.00	3,368.25	
Extra clearing, 1.431 acres at $700.00	1,001.70	
Extra grubbing, 1.9638 acres at $850.00	1,669.23	
Force account items:		
Relaying 24-inch culvert due to failure of foundation	82.52	
Driving piling in lieu of constructing box culverts	2,652.88	
Clearing logs at Fogerty Creek channel	200.51	
Blading county road for use as detour	294.31	
Hand-placed rock slope to protect against surf	269.58	
Sanding all roadbed of clay formation	257.61	
Drilling and shooting prospective quarry site	67.58	
Total amount paid to contractor		161,038.52
Grand total cost of project		$169,574.54

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$76,345.40	$ 80,318.91	$156,664.31
Expended 1927-28 biennium	Cr. 14,534.28	27,444.51	12,910.23
Total of expenditures	$61,811.12	$107,763.42	$169,574.54

[LINCOLN]

Otis Section Temporary Surfacing

On the Salmon River Road, from the Junction with the Roosevelt Coast Highway near Otis, east a distance of 1.25 miles; 1.25 miles of temporary surfacing laid in one course four inches thick, 7½ feet wide on top, feathered to 8½ feet wide on the bottom.

Contract No. 992, awarded July 28, 1927, to Howard McMillen, of Willamina, Oregon. Work commenced August 24, 1927; completed October 22, 1927. Final cost, $2,251.21, from improvement district funds. Resident Engineer, F. D. Eason.

In order to provide an adequate all-year-round outlet to the Roosevelt Highway at Otis from the Salmon River road over the short section of approximately 1¼ miles east from Otis, a contract was let by the Salmon River-Grande Ronde Highway Improvement District on advertisement through the office of the State Highway Commission for a temporary gravel surfacing. Gravel for this work was secured from the Salmon River at a point about one-fourth mile east of the Roosevelt Highway. In connection with this job there was also furnished by the contractor 500 cubic yards of gravel for maintenance of the state highway, which was stocked on that highway near Otis. This part of the work was, of course, paid for by the state as a maintenance expenditure and not by the district.

South Beach-Beaver Creek Forest Road Project

This project is seven miles in length and extends from the end of the present trestle at South Beach, south to Beaver Creek. A contract for the construction was awarded by the Bureau of Public Roads to E. L. Gates of Portland, who began construction operations in September, 1928. At the present time the project is approximately 35 per cent complete. In order that a very dangerous section of the beach could be eliminated and that access might be secured to rock suitable for surfacing, the project was extended 1.1 miles to Seal Rocks.

The construction of the bridge at Beaver Creek was awarded under separate contract to O. N. Pierce of Portland. Work on this structure was started in October, 1928, and the bridge is approximately 10 per cent complete at the present time.

The estimated cost of the grading and the bridge is $163,000, to be paid entirely from federal government funds. The government expenditures to date amount to $30,131.19.

Blodgett-Eddyville Grade Widening

On the Corvallis-Newport Highway, from a point approximately 2.8 miles east of Blodgett west to Eddyville at the crossing of the Southern Pacific Railroad; 19.42 miles of grade widening, class "A" 30-foot standard roadbed, of which 11.38 miles is in Lincoln County and 8.04 miles in Benton County.

Work done by state forces. Work commenced August 18, 1926; completed May 28, 1927. Final cost, $35,045.80, from state funds. Resident Engineer, A. A. Amort.

In preparing this section of the Corvallis-Newport Highway for resurfacing work the originally built 20-foot grade has been widened to a

[LINCOLN]

30-foot standard roadbed. This has been done as a continuing project, there having been completed and reported in the last biennial report that at the time of that report four miles in Lincoln County and two miles in Benton County had been completed.

During the early part of this biennium the work was continued until in all 19.42 miles of the highway was widened, of which 11.38 miles is in Lincoln County and 8.04 miles is in Benton County.

Traffic was carried uninterruptedly over the work at all times. The heavy part of the work was done with a small gas shovel.

Since completion of this widening work this section has been resurfaced and later oiled, as will be seen elsewhere in this report.

Further details will be found on page 371 of the 1925-1926 report.

De Poe Bay Bridge

Federal Aid Project No. 110-C

On the Roosevelt Coast Highway, at De Poe Bay; one 150-foot concrete arch with three 40-foot and one 23-foot concrete approach spans.

Contract No. 888, awarded May 25, 1926, to Kuckenberg & Wittman, of Portland, Oregon. Work commenced July 13, 1926; completed June 10, 1927. Final cost, $55,557.09. Resident Engineer, R. G. Barnes.

This bridge is across the mouth of De Poe Bay, a small landlocked cave on the section between Newport and the Siletz River. The design is in keeping with the beautiful section of highway adjacent to the bridge.

Further details will be found on page 369 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,187.63
Name plates furnished by state		31.00
Bull's-eye reflectors for traffic control		17.30
Contract items as follows:		
Excavation to plan elevation, 127.5 cu. yds. at $5.00	$ 937.50	
Excavation below elevation, 176.5 cu. yds. at $10.00	1,765.00	
Class "A" concrete, 775.5 cu. yds. at $37.00	28,693.50	
Class "D" concrete, 235.8 cu. yds. at $37.00	8,724.60	
Metal reinforcement, 147,578.75 lbs. at 6c	8,854.73	
Concrete handrail, 605.96 lin. ft. at $5.00	3,029.80	
Additional cement, 71.5 bbls. at $4.42	316.03	
Total amount paid to contractor		52,321.16
Grand total cost of structure		$55,557.09

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$38,023.38	$	$38,023.38
Expended 1927-28 biennium	Cr. 17,538.50	35,072.21	17,533.71
Total of expenditures	$20,484.88	$35,072.21	$55,557.09

Siletz River Bridge

Federal Aid Project No. 110-B

On the Roosevelt Coast Highway, about two miles south of Taft; one 238-foot steel draw span and 25 19-foot pile trestle spans over Siletz River and 11 19-foot pile trestle spans over Millport Slough.

Contract No. 869, awarded February 25, 1926, to Union Bridge Company, of Portland, Oregon. Work commenced March 20, 1926; completed January 22, 1927. Final cost, $119,977.65. Resident Engineer, O. A. Chase.

[LINCOLN]

This bridge is across the Siletz River at the head of Siletz Bay. The steel draw span as originally built was operated by hand. The volume of water traffic, however, became so great that electric power was installed. The trestle approach rests on composite piling, fir piling below ground water line spliced to concrete piling above. The piling are capped by concrete beams, making a permanent substructure.

Further details will be found on page 368 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 6,123.02
Labor and materials furnished by state:		
Constructing sheer boom		178.78
Furnishing and installing navigation lights		424.35
Chain gates for traffic barrier		15.91
Alemite gun for lubricating machinery		7.56
Painting handrail		284.62
Concrete culvert pipe under approach fill		112.83
Crushed rock furnished for contractor's use		2,354.00
Contract items as follows:		
Excavation, 595.6 cu. yds. at $8.00	$ 4,764.80	
Foundation piling, 5,209.0 lin. ft. at 40c	2,083.60	
Cedar piling, 2,590.0 lin. ft. at 60c	1,554.00	
Concrete piling, 2,047.0 lin. ft. at $4.00	8,188.00	
Class "B" concrete, 186.17 cu. yds. at $30.00	5,585.10	
Class "A" concrete, 453.82 cu. yds. at $30.00	13,614.60	
Seal concrete, 241.9 cu. yds. at $30.00	7,257.00	
Metal reinforcement, 27,511.0 lbs. at 7c	1,925.77	
Structural steel, 375,608.0 lbs. at 8c	30,048.64	
Trestle superstructure, 682.8 lin. ft. at $20.00	13,656.00	
Lumber and timber, 61.135 M-FBM at $67.00	4,096.05	
Machinery, 38,396.0 lbs. at 33c	12,670.68	
Piling in dolphins, 1,326.0 lin. ft. at 54c	716.04	
Composite pile joints, 54.0 each at $60.00	3,240.00	
Concrete pile cut-offs, 88.75 lin. ft. at $2.00	177.50	
Wood pile cut-offs, 480.0 lin. ft. at 14.7c	70.56	
Force account items:		
Driving test piling	172.29	
Driving pier protection piling	633.88	
Material furnished for permanent forms around piers	466.97	
Constructing sheer boom	137.28	
Providing runway on protection piles	129.84	
Adjustment items:		
Extra cost of sand required	290.00	
Changing footings from seal type to open excavation type	1,604.62	
Washing coarse aggregate	292.91	
Changing construction of Millport Slough bridge from square bents to skew bents	325.95	
Total amount earned by contractor	$113,702.08	
Deductions:		
Crushed rock furnished by state	2,764.85	
Shortage of cement used in construction	335.65	
Omission of paint on handrail	125.00	
Total amount paid to contractor		110,476.58
Grand total cost of structure		$119,977.65

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$83,205.79	$14,755.17	$ 97,960.96
Expended 1927-28 biennium	Cr. 29,561.44	51,578.13	22,016.69
Total of expenditures	$53,644.35	$66,333.30	$119,977.65

[LINCOLN]

Yachats River Bridge

On the Roosevelt Coast Highway, near Yachats; one 140-foot steel span and three 23-foot trestle spans.

Contract No. 886, awarded May 25, 1926, to C. J. Montag Company, of Portland, Oregon. Work commenced January 12, 1926; completed April 1, 1927. Final cost, $23,034.42. Resident Engineer, J. T. Skelton.

When the county bridge over the Yachats River became too dangerous to continue in service, this permanent structure was built on the adopted highway survey and connected to the existing road by temporary approaches. As this section is brought to permanent grade and alignment this bridge will fit in without change.

Further details will be found on page 368 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 1,882.42
Bronze name plates		27.90
Clearing right of way for approaches		172.50
Contract items as follows:		
Excavation to plan elevation, 105.19 cu. yds. at $3.00	$ 315.57	
Excavation below elevation 62.00 cu. yds. at $10.00	620.00	
Concrete piling, 131.46 lin. ft. at $3.00	394.38	
Class "A" concrete, 6.36 cu. yds. at $23.00	146.28	
Class "B" concrete, 134.20 cu. yds. at $23.00	3,086.60	
Class "D" concrete, 71.18 cu. yds. at $23.00	1,637.14	
Metal reinforcement, 26,255.0 lbs. at 5c	1,312.75	
Structural steel, 158,422.0 lbs. at 7¼c	11,485.60	
Lumber, 5.28 M-FBM at $90	475.20	
Trestle superstructure, 72.0 lin. ft. at $14.50	1,044.00	
Force account items:		
Removing tree and stump at bridge site	30.02	
Placing angle irons at ends of concrete deck	9.45	
Building 210 ft. of trestle approach and backfilling at south bulkhead	470.35	
Placing expansion joint material in floor beams and curbs	17.33	
Total amount earned by contractor	$21,044.67	
Deduction for cement adjustment	93.07	
Total amount paid to contractor		20,951.60
Grand total cost of structure		$23,034.42

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$15,204.95	$	$15,204.95
Expended 1927-28 biennium	2,829,47	5,000.00	7,829.47
Total of expenditures	$18,034.42	$ 5,000.00	$23,034.42

Rocky Creek Bridge

Federal Aid Project No. 110-A

On the Roosevelt Coast Highway; one 160-foot concrete arch with eight 20-foot and two 23½-foot concrete approach spans.

Contract No. 887, awarded May 25, 1926, to H. E. Doering, of Portland, Oregon. Work commenced July 16, 1926; completed August 1, 1927. Estimated cost, $59,000, consisting of $28,951.85 from state funds and $30,048.15 from government funds. Expenditures to date $51,359.87, consisting of $21,311.82 from state funds and $30,048.15 from government funds. Resident Engineer, J. T. Skelton.

This structure is on the rough and picturesque section between Newport and the Siletz River. It is one of the most beautiful bridges on the state highway system. Work did not proceed as rapidly as was anticipated

[LINCOLN]

and construction continued through the winter months when the transportation of materials and supplies was very difficult. This job is complete but final settlement had not been made with the contractor at the end of the biennium.

Further details will be found on page 368 of the 1925-26 report.

Power Equipment at Siletz Bridge

On the Roosevelt Coast Highway, about two miles south of Taft. Work commenced November, 1927; completed, February 16, 1928.

During this biennium water traffic on the Siletz River has increased considerably. In order to handle this traffic expeditiously, electric motors were installed to open and close the draw span. Living quarters were also constructed at the north end of the bridge to accommodate the bridge operator who is continuously on duty. This work was done by state forces under the direction of J. A. Weber, and has occasioned expenditures of $6,322.54 from state funds.

Maintenance

Division No. 1:

The single feature of the maintenance work in Lincoln County north of the Siletz River during the past two years, which is of special interest, has been in connection with the slide which occurred just south of Schooner Creek on Siletz Bay. This slide is not particularly remarkable nor unusual for a slide in the coast country in this state where rainfall is so heavy and the general character of the country such that slides are of very common occurrence, especially where the hills have been sliced off by construction work. In this instance the slide area is from 100 to 150 feet wide, parallel with the highway and approximately 350 feet long, at right angles to the highway, the depth of the moving material varying from 10 to 40 feet. Both steam shovel and sluicing methods were used in its removal, the former in the earlier stages of the operation while the highway roadbed, which had been blocked by the slide, was being cleared, and the latter later on when the moving materials were being taken out some distance back from the highway. The slide originally occurred in the winter of 1926 and 1927, and by spring, when the end of the rainy season permitted the slide to drain out and movement stopped, approximately 35,000 cubic yards of material had been removed. This, however, was only about two-thirds of the total amount which was actually sliding, and it is anticipated that movement will again start with a lubrication of the slide material, and strata upon which it is moving, by rain during the coming winter, and that eventually the entire body of the slide will have to be removed.

Division No. 2:

The maintenance of all sections of the state highway system within the boundaries of Lincoln County that have been constructed to state standard alignment and grade, with the exception of the Alsea Highway from the Lincoln County line to Waldport, has been carried on by the state crews and equipment during the past biennium. The sections under maintenance are as follows:

Roosevelt Coast Highway from the Tillamook County line to Newport; Corvallis-Newport Highway from Benton-Lincoln County line to New-

[LINCOLN]

port, aggregating a total distance of 61.73 miles; the entire length being surfaced with crushed rock or crushed gravel macadam, of which approximately 20 miles have been oiled.

Maintenance work in the county consisted of the general patrol maintenance of rights of way, ditches, roadbed and surfaces and has been carried on under the direction of W. D. Clarke, Division Engineer, Salem, Oregon, and G. S. Gray, Resident Engineer, Tillamook, Oregon, for that section of the county north of the Siletz River, and under J. S. Sawyer, Division Engineer, Salem, Oregon, and T. A. Rice, Resident Engineer, Newport, Oregon, for that section of the county south of the Siletz River.

Eddyville-Toledo Stripping Quarry

On the Corvallis-Newport Highway; Steinmetz Quarry Development.

Work commenced January 22, 1927; completed April 15, 1927. Final cost, $3,211.34, from state funds. Resident Engineer, T. A. Rice.

Early in 1927 in anticipation of the surfacing of the Eddyville-Toledo section of the Corvallis-Newport Highway during 1927-1928 a considerable amount of development work was done in the Steinmetz quarry site in the nature of stripping the overburden off from the quarry so that it would be in good shape to be operated.

On this particular section of the highway satisfactory surfacing material is very scarce, the Steinmetz site being the only one available between Eddyville and Toledo. In doing the stripping work state crews and equipment were used. The equipment consisted of a high pressure pumping unit, pipe and hose. The earth overburden was sluiced from the quarry site, which is located on a very steep hillside, into the river bottom of the Yaquina River. In the course of this operation an area approximately one and one-half acres in extent was sluiced off, the overburden having an average depth of six feet.

This work was carried on under the direction of T. A. Rice, Resident Engineer, Newport, Oregon.

West Unit, Blodgett-Eddyville Resurfacing

On the Corvallis-Newport Highway, from Sta. 1715+50 at the grade crossing of the Southern Pacific Railroad at Eddyville, east to Sta. 1365 at Kline's Mill about 10 miles west of Blodgett; 6.58 miles of rock and gravel resurfacing.

Contract No. 914, awarded August 26, 1926, to J. C. Compton, of McMinnville, Oregon. Work commenced October 9, 1926; completed August 18, 1927. Final cost, $42,298.94. Resident Engineer, A. A. Amort.

This project was let in connection with, and at the same time as, the East Unit of the Blodgett-Eddyville section.

Gravel for the resurfacing work was produced by Contractor Compton from a dry bar on the Willamette River near Granger, about midway between Albany and Corvallis. The gravel was taken out of the bar with the drag line method and after being crushed, washed and screened, was loaded onto five-ton trucks and hauled approximately three-quarters mile to Granger station on the Southern Pacific Railroad, where it was loaded into cars and shipped to Eddyville.

[LINCOLN]

At Eddyville, the material having been shipped in bottom dump cars, was dumped into a small hopper and then elevated into a small bunker from where it was again delivered to trucks and hauled to the job.

Further details will be found on page 369 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 574.58
Prospecting for surfacing materials		120.72
Furnishing, hauling and spreading filler		101.44
Processing surfacing		3,131.86
Sprinkling surfacing during construction		525.09
Cleaning ditches and culverts		25.20
Signs for control of traffic		9.40
Freight or gravel deducted from contractor's estimate		12,855.79
Contract items as follows:		
Base course crushed gravel, 3,512.5 cu. yds. at $2.85	$10,010.63	
Top course crushed gravel, 7,232.5 cu. yds. at $2.85	20,612.63	
Crushed gravel maintenance materials, 4,592.0 cu. yds. at $2.85	13,087.20	
Total amount earned by contractor	$43,710.46	
Deductions:		
Freight on gravel based on 4c per cwt.	17,141.05	
Reduced average haul on maintenance materials	1,614.55	
Total amount paid to contractor		24,954.86
Grand total cost of project, all state funds		$42,298.94

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 1,949.27
Expended 1927-28 biennium	40,349.67
Total of expenditures	$42,298.94

Waldport-Hatchery Maintenance Materials

On the Alsea Highway, from Sta. 245+00, which station is at the east end of the Lint Creek Bridge just east of the town of Waldport, east to Sta. 206+00, which station is near the State Salmon Hatchery about one and one-half miles east of Tidewater; 11.29 miles of crushed gravel resurfacing consisting of 1,642 cubic yards of one-inch material laid over a five-mile stretch, and 3,270 cubic yards of one and one-half-inch material laid over a 6.29-mile stretch. Also 3,119½ cubic yards of maintenance material in stock piles.

Contract No. 989, awarded July 28, 1927, to C. G. McKy, of Eugene, Oregon. Work commenced September 1, 1927; completed December 3, 1927. Final cost, $13,122.51. Resident Engineer, Carl A. Peterson.

Material for this project was secured from a Lincoln County owned gravel bar in the Alsea River located approximately eight miles east of Waldport.

The specifications for the project provided that a portion of this maintenance material, or approximately 3,400 cubic yards of one and one-half-inch crusher run gravel, and approximately 2,500 cubic yards of one and one-quarter-inch crusher run material be placed on the road as a light resurfacing and the remaining, approximately 3,100 cubic yards, be stock piled at various points along the section.

[LINCOLN]

The contractors moved onto the job promptly after the award of the contract and set up a small crusher and screening plant to which they delivered the gravel from the bar with a drag line operation. After being crushed, the material was hauled to the road and stock piled with light pneumatic-tired trucks.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,014.98
Contract items as follows:		
Grade "A" materials on road, 1,640.0 cu. yds. at $1.10	$1,804.00	
Grade "B" materials on road, 3,272.0 cu. yds. at $1.10	3,599.20	
Grade "B" materials at roadside, 788.0 cu. yds. at $1.10	866.80	
Grade "A" materials stock piled at plant, 1,331.6 cu. yds. at $1.34	1,784.34	
Hauling crushed gravel, 20,154.0 yd. mi. at 20c	4,030.80	
Force account items:		
Clearing and grubbing stock pile site	22.39	
Total amount paid to contractor		12,107.53
Grand total cost of project, all state funds, 1927-28		$13,122.51

Tidewater Maintenance Materials

On the Alsea Highway, five miles east of Tidewater on the Scott Creek section; 1,500 cubic yards of crusher run stone maintenance material in stock pile; materials furnished from July 9, 1927, to July 19, 1927. Final cost, $3,138.60, from state funds. Resident Engineer, Mr. Stoddard, of the Bureau of Public Roads.

During July, 1927, under the direction of the U. S. Bureau of Public Roads, the contractors, Joplin, Eldon and Burpee, who were completing the surfacing of the Lincoln County Line-Hatchery section of the Alsea Highway surfacing, were employed by the state to crush and stock pile along the highway 1,500 cubic yards of three-quarter-inch crusher run maintenance material at a price of $2 per cubic yard f.o.b. bunkers plus nine cents per one-half mile for hauling and stock piling.

This additional maintenance material was secured and stock piled by the state for the reason that the Bureau of Public Roads' contract only provided for the stock piling of approximately 150 cubic yards per mile for the entire project and this amount was considered too small, so advantage was taken of the fact that the contractors were set up and operating and would produce the material at a favorable price.

This work was carried on under the direction of Mr. Stoddard, Resident Engineer in charge of the U. S. Bureau of Public Roads' operations, who was very kindly loaned to the state by the bureau for this maintenance material work.

Otter Crest Park Site

During the 1925-26 biennium it was decided to acquire a small tract of land located at the summit of Otter Crest and lying between the Roosevelt Coast Highway and the bluff. Negotiations were entered into with the owner, W. S. Badley, which negotiations were under consideration for some little time, there being some differences between the state and the owner as regards the price to be paid for the property. In fact, at one time a condemnation suit was filed, which later was dismissed and an amicable arrangement reached whereby the property was purchased in

[LINCOLN]

March, 1928, for the sum of $500 plus the cost of grading and surfacing an entrance road to the Badley property on the east side of the highway opposite Otter Crest Park site, which latter work cost approximately $150.

The Otter Crest Park site, located as it is at the top of Otter Crest and commanding a view of the rugged shore of the Pacific Ocean for miles in either direction, is a site that will be much appreciated by the traveling public as a place to stop to view the wonderful scenery.

Since the acquiring of this tract temporary improvement work such as the leveling off and surfacing of a parking spot and the construction of a temporary rustic pole fence has been done. Total expenditures for the past two years have amounted to $1,115.09.

Development work has been carried on under the direction of T. A. Rice, Resident Engineer, Newport, Oregon.

Devil's Punch Bowl Park Site

The Devil's Punch Bowl Park site is a small tract lying at the western end of the town of Otter Rock, on a point jutting out into the Pacific Ocean, and surrounds the most attractive feature of the park, the Devil's Punch Bowl. This bowl is described as a circular depression in the bluff fronting on the ocean, having a diameter of approximately 60 feet and being connected with the ocean by several caves or tunnels, through which, in stormy weather, the waves break through in a seething mass of foam and spray.

This beautiful site has been donated to the state by Mr. F. W. Leadbetter, of Portland, Oregon.

In keeping with the general policy of the commission some minor development work has been carried on at the Devil's Punch Bowl Park site during the 1927-1928 biennium and has consisted of the clearing away of the underbrush over the entire area of the park, the trimming up of shrubs and trees and the grading and rock surfacing of a temporary road entering the park from the town of Otter Rock.

As a means of protecting the public against accidents in falling over the precipitous bluff, an inexpensive rustic pole fence has been constructed around the three sides of the park fronting the ocean and an inexpensive plank stairway has been constructed from the high levels of the park down to the rim of the punch bowl proper.

This betterment work has been carried on under the direction of T. A. Rice, Resident Engineer, Newport, Oregon, with total expenditures of $1,064.13, from state funds.

Bela Wright Quarry Site at Seal Rocks

In connection with the construction of the Roosevelt Coast Highway between Yaquina Bay and Alsea Bay, it was thought advisable to procure, well in advance of the construction work, material sites for the surfacing work. Good quality of surfacing material for this section of the highway is scarce and hard to find, and it was thought at first that the only site available would be to take the Seal Rock proper; but on further and more detailed investigation the Bela Wright location was found and purchased

for the sum of $1,200, which comprised Lots 11, 12, 13, 14 and the west one-half of Lot 15 in Block 48 of Brassfield's Addition to Seal Rocks, and is a rectangular tract having dimensions of 195 feet north and south and 210 feet east and west.

Considerable development work in the nature of prospecting, which consisted of excavating a trench approximately 300 feet long, two feet wide and varying in depth from one to seven feet to show up the location of the rock ledge, has been done. In addition to this trench eight or nine shallow prospect holes, varying in depth from two to four feet, and one shaft, 4 by 30 feet were sunk.

Yachats Park Site

Early in the biennium it was decided to secure a park site at Yachats, located on the prominent Yachats Point in the western end of the First Addition to Yachats and comprising 26 lots. Negotiations were entered into with the eight to 10 owners of these several lots, but it has been quite difficult to close the deal with so many interested parties.

At the writing of this report negotiations with all but one of the owners have been completely closed up and the deeds have been secured. This one remaining deal will be completed in the near future. It is estimated that the total cost of the park site will be approximately $7,500. Expenditures to date have amounted to $6,255.50.

Yachats Quarry Site

During the early part of this biennium and in anticipation of the need of material sites from which surfacing material for the construction of the Roosevelt Coast Highway could be procured, negotiations were entered into with Mr. A. D. Wier of Corvallis, Oregon, and Mr. J. L. Hartley of Yachats, Oregon, owners of a tract of land containing a prospective quarry site which was located on a county road one-quarter mile up the Yachats River from the town of Yachats.

This tract, comprising two acres, being 400 feet east and west and 217.18 feet north and south, was acquired from Mr. Wier and Mr. Hartley at a price of $380. Total expenditures have amounted to $402.

No development work has been done on this quarry site since its purchase.

Burnt Woods Maintenance Headquarters Site

The Burnt Woods maintenance headquarters site is located adjacent to the Corvallis-Newport Highway at Burnt Woods, Oregon, and comprises a level tract of land having a frontage of 221 feet along the highway and a depth of 175 feet and contains 1.1 acres.

This tract was purchased from Mr. A. O. Leech, Portland, Oregon, in March, 1928, for $100.

Lane County Line-Devil's Lake Survey

The original location surveys of the Roosevelt Coast Highway across Lincoln County were made some years ago, but since their completion and after the several sections have been constructed and built, it has been found advisable to relocate portions of the line.

[LINCOLN]

At various and different times during 1927 and 1928, when not otherwise engaged in construction and maintenance work, a relocation study of that portion of the line from the connection of the Roosevelt Coast Highway with the Corvallis-Newport Highway in Newport, to the north shore of Yaquina Bay at McLean's point has been undertaken. This survey has consisted of the running of several preliminary lines aggregating a total distance of approximately 10 miles in an attempt to secure, if possible, the best location for that section of the highway.

This particular section offers several difficulties in both grade and alignment, due to the fact that it is necessary to secure a good grade over ground that is quite steep and rugged and cut with many cross drainages, to say nothing of traversing a quite populous suburban homesite tract within the city of Newport. At the time of writing the various lines have been run on the ground and the map and office work is being completed as rapidly as possible and it is estimated that the final location survey will be completed early in 1929.

Other work on relocation surveys consisted of the relocation of the line from the south shore of Yaquina Bay southward to the town of Seal Rocks, approximately eight and one-half miles, which also involves the line across Yaquina Bay as a future bridge site. The permanent location has been made from the south shore of Yaquina Bay to Seal Rocks and at the present time is under contract for grading under the direction of the Bureau of Public Roads, but the definite location of the bridge across Yaquina Bay is as yet undetermined.

Field work on these relocation surveys has been done under the direction of T. A. Rice, Resident Engineer, Newport, Oregon, assisted for a short time by Carl A. Peterson, Resident Engineer, Corvallis, Oregon.

Waldport-Yachats Survey

The Waldport-Yachats section of the Roosevelt Coast Highway location survey was made several years ago, but during the latter part of 1928, in anticipation of an early construction project, a small location party was put in the field under the direction of Carl A. Peterson, Resident Engineer, Corvallis, Oregon, to rerun and/or locate this section if a better location was to be had.

The original location contemplated a grade crossing of the Pacific Spruce Corporation's logging railroad inside the city limits of the town of Waldport, following along the east or inland side of the logging railroad for several miles and then crossing the railroad again at grade to a location between the railroad and the ocean.

After making thorough investigation of the several possibilities that presented themselves, it was decided to run a relocation survey covering the line entirely between the railroad and the ocean from Waldport and Yachats.

At the present time the preliminary field work and most of the preliminary office work on this survey is completed. However, a definite decision as to whether this relocated line or the old original location line will be used has not been made.

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Yaquina Bay-Alsea Bay Materials Prospecting

During the last one-half of 1927 and early in 1928 a considerable time was spent by an engineering party in searching the country in the vicinity of the Roosevelt Coast Highway between Yaquina Bay and Alsea Bay for suitable surfacing material.

After diligent search it was at first thought that the only available supply would be to use Seal Rock, which is a bare, exposed rock or island of some 200,000 cubic yard volume, located between the high and low water line of the Pacific Ocean near the town of Seal Rocks. This so-called Seal Rock was considered by many prominent people of the state as one of the valuable scenic attractions and it was, therefore, decided not to use this rock for road construction purposes but to seek other sources.

After further search a prospective site was located near Seal Rocks and enough development work in the way of stripping off the overburden until the rock was exposed, the sinking of shafts into the rock and drift tunneling was done to secure accurate data as to the amount and quality of rock available. Later the material site chosen was purchased and is mentioned elsewhere in this report.

Development work, prospecting and surveys in connection with this project have been carried on under the direction of T. A. Rice, Resident Engineer, Newport, Oregon.

LINN COUNTY

During the 1927-1928 biennium, construction work on state highways in Linn County has centered around the completion of the Santiam Highway from Albany to the Ranger Station above Cascadia, upon which excellent progress has been made.

From Albany to Lebanon the previously graded and macadamized section has been oiled; from Lebanon to Shea's Hill the grading has been completed and a surfacing contract has been let and is under way with the completion date set for the fall of 1929.

Previous to this report the Shea's Hill section had been graded and macadamized under the direction of the U. S. Bureau of Public Roads; the section from Shea's Hill to Cascadia has been graded and macadamized and the section from Cascadia to the Ranger Station is, at the present time, under contract for grading and partly completed with a completion date for the grading and surfacing early in 1929.

Further activities on this highway consisted of the survey being made by the Bureau of Public Roads' Forest Department from Sisters to the Ranger Station. Field work on this survey has been completed to the extent that a complete preliminary line has been run from which a projected location is planned to be worked up soon.

State Highway work in Linn County, except major bridge construction projects, has been carried on under the direction of J. S. Sawyer, Division Engineer, Salem, Oregon.

Albany-Lebanon Grading and Surfacing

On the Santiam Highway, from Sta. 64+23.5, which station is at the east limits of the city of Albany, east to Sta. 743+50, in the city of Lebanon; 12.56 miles of grading and crushed gravel surfacing; 14 feet wide on top, feathered to 18 feet at bottom; eight inches thick laid in three courses, one four-inch course of base material and two two-inch courses of top material.

Contract No. 838, awarded July 28, 1925, to Kibler & Bartlett, of Tacoma, Washington. Work commenced August 8, 1925; completed June 28, 1926. Final cost, $112,359.33. Resident Engineer, E. E. Umphlette.

This project has been opened during the present biennium only to record the payment of $1,629.76 in final cooperation by Linn County and a payment of $680.49 by the Mountain States Power Company as cooperation in the construction of a bridge over the company's power canal at Lebanon.

The final cost now consists of $60,200.21 from state funds, $51,478.63 from county funds and $680.49 from the Mountain States Power Company funds.

Further details will be found on page 374 of the 1925-26 report.

Lebanon-Shea's Hill Surfacing

On the Santiam Highway, from Sta. 806+00, which station is at the intersection of Main street with the south corporate limits of the town of Lebanon, east to Sta. 1715+50, which station is approximately one mile east of the town of Foster; 17.24 miles of crushed gravel surfacing

laid in four courses, two courses of sub-base material each three and one-half inches thick, one course of base material three inches thick, and one course of top material two inches thick; trenched.

Contract No. 1,048, awarded August 14, 1928, to John J. Dann, of Portland, Oregon. Work commenced August 21, 1928. Estimated cost, $120,000, being $64,000 from state funds and $56,000 from county funds. Expenditures to date, $8,274.60, consisting of $704.54 from state funds and $7,570.06 from county funds. Resident Engineer, E. E. Umphlette.

The contract for the surfacing of this section of the Santiam Highway contemplated for work during the 1928 season only the laying of the sub-base course on these sections of the highway which were in conflict with the old county road and over which travel must be maintained during the winter of 1928-29 until the surfacing on the new road is completed in the fall of 1929, aggregating a total length of approximately three miles.

Contractor Dann moved onto the work promptly after the award of the contract and has complied with the provision of the specifications, having covered all of the conflicts with the sub-base course.

Crushed gravel for rocking the conflicts, about one mile in length, just out of Lebanon, was secured by the contractor from the Linn County gravel plant at Lebanon. For the conflicts on the east end of the project near Foster and Sweet Home, the contractor set up a temporary crushing plant on the banks of the Santiam River about one-half mile west of Sweet Home, where he produced a very good quality of crushed gravel, hauling it to the job in large trucks.

At the writing of this report work is closed down for the winter.

Cascadia-East Forest Road Project

This project is two and eight-tenths miles in length, and extends easterly from Cascadia to the Cascadia Ranger station. A contract for the grading of the project was awarded to R. W. Shaffer of Portland by the Bureau of Public Roads. Work under this contract was started during the summer of 1928, and is approximately 95 per cent complete at the present time.

The total estimated cost of the work is $30,000, of which the county and government are to pay $15,000 each. Expenditures to date amount to $26,201.11, consisting of $15,000 from county funds and $11,201.11 from government funds.

Lebanon-Shea's Hill Grading

On the Santiam Highway, from Sta. 806+00, which station is at the intersection of Main street with the south corporate limits of the town of Lebanon, east to Sta. 1715+50, which station is approximately one mile east of the town of Foster; 17.24 miles of grading, class "A" 30-foot standard roadbed.

Contract No. 980, awarded June 23, 1927, to Slate Construction Company, of Albany, Oregon. Work commenced June 26, 1927. Estimated cost, $167,000. Resident Engineer, E. E. Umphlette.

The specification for this project was written in such a way that the contractor was required to do the clearing and grubbing and such of the grading as would not conflict with the old county road over which traffic

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had to be maintained during the winter of 1927-1928, and the contractor was, therefore, not allowed to disturb these sections of the old road.

In accordance with the contract, Slate Construction Company moved onto the job promptly and completed a substantial mileage during the fall and early winter of 1927 and then closed down operations during the wet season. Early in 1928 they again resumed operations and at the writing of this report the grading work is practically completed.

The original specification provided for the completion of this grading work on July 31, 1928, but due to changes in the original plan, which were made to accommodate the construction of the Linn County Logging and Lumber Railway (now the Oregon Electric Railway) through the "Narrows" for a distance of approximately one mile, the yardage quantities were very materially increased and the time limit on the contract was extended.

Excellent progress has been made on this piece of construction work by the contractors.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 9,930.17
Sprinkling portions of new grade		309.29
Contract items as follows:		
Clearing and grubbing, 98% of total	$ 8,820.00	
Extra clearing, 90% of total	117.00	
Common excavation, 116,945.0 cu. yds. at 34c	39,761.30	
Intermediate excavation, 51,713.0 cu. yds. at 34c	17,582.42	
Solid rock excavation, 14,818.0 cu. yds. at $1.05	15,558.90	
Overhaul, 208,930.0 yd. sta. at 5c	10,446.50	
Truck haul, 2,240.0 yd. mi. at 23c	515.20	
Class "A" concrete, 378.42 cu. yds. at $25.00	9,460.50	
Metal reinforcement, 33,840.0 lbs. at 7c	2,368.80	
Lumber and timber, 131.276 M-FBM at $50.00	6,563.80	
Timber piling, 1,806.0 lin. ft. at $1.00	1,806.00	
12-inch concrete pipe, 1,893.0 lin. ft. at $1.20	2,271.60	
18-inch concrete pipe, 948.0 lin. ft. at $2.00	1,896.00	
24-inch concrete pipe, 285.0 lin. ft. at $2.80	798.00	
36-inch concrete pipe, 190.0 lin. ft. at $5.00	950.00	
Pit-run gravel, 66.0 cu. yds. at 75c	49.50	
Gravel haul, 446.0 yd. mi. at 10c	44.60	
Extra clearing and grubbing, 6.0 acres at $300.00	1,800.00	
Rubble masonry, 604.0 cu. yds. at $6.00	3,624.00	
Grout, 75.18 cu. yds. at $20.35	1,529.91	
6-inch porous drain tile, 1,335.0 lin. ft. at 25c	333.75	
Rock backfill, 122.0 cu. yds. at $2.50	305.00	
Force account items:		
Removing and replacing portions of rock wall to allow foundation excavation	172.36	
Constructing corrugated iron pipe extensions	89.51	
Materials on hand:		
12-inch concrete pipe, 207.0 lin. ft. at 68c	140.76	
Lumber, 16.000 M-FBM at $21.60	345.60	
Posts, 14.900 M-FBM at $24.30	362.07	
Paint, 48.0 gallons at $1.60	86.40	
Total amount earned by contractor	$127,799.48	
Less retained percentage	11,454.20	
Total amount paid to contractor		116,345.28
Grand total expended on project, 1927-28		$126,584.74

PARTICIPATION IN COST

	State	*County*	*Railroad*	*Total*
Expended to date	$56,463.07	$46,223.61	$23,898.06	$126,584.74
Estimated cost to complete	11,536.93	10,776.39	18,101.94	40,415.26
Total estimated costs	$68,000.00	$57,000.00	$42,000.00	$167,000.00

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Unit 2, Shea's Hill-Cascadia Forest Road Project

The grading of this project was undertaken during the prior biennium, and a descriptive article will be found on page 374 of the last report. This grading is estimated to cost a total of $80,000, consisting of $40,000 each from county and government funds. Expenditures to date amount to $77,793.41, being made up of $40,000 from county funds and $37,793.41 from government funds.

In order to provide for the surfacing of the project, a contract was awarded by the Bureau of Public Roads to R. W. Shaffer of Portland. Surfacing operations were started in the summer of 1927, and were completed early in the summer of 1928. The contract originally made with Mr. Shaffer was extended in order to provide base course surfacing materials for the forest road section east of Cascadia. This material was stock piled at Cascadia and will be placed on the road next season.

The estimated cost of the surfacing operations is $48,500, of which the county share amounts to $23,500 and the government share amounts to $25,000. The expenditures to date amount to $48,001.43, consisting of the entire county share and $24,501.43 from government funds.

Wiley Creek Bridge

On the Santiam Highway, at Foster; three 19-foot pile trestles, one 100-foot standard deck truss, three 19-foot pile trestles, one 23-foot pile trestle and three 19-foot pile trestle spans.

Contract No. 1,026, awarded December 20, 1927, to Portland Bridge Company, of Portland, Oregon. Work commenced January 11, 1928; completed March 26, 1928. Final cost, $16,727.73. Resident Engineer, R. G. Barnes.

This structure replaces a timber truss one-quarter mile down stream. Pending the surfacing of the approach grade, adjacent to the bridge, travel is being routed over the old bridge. The new structure will be placed in use early in the spring.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,173.60
Contract items as follows:		
Excavation, 135.86 cu. yds. at $2.00	$ 271.72	
Cedar piling, 907.0 lin. ft. at 20c	181.40	
Class "B" concrete, 118.21 cu. yds. at $30.00	3,546.30	
Class "D" concrete, 69.59 cu. yds. at $30.00	2,087.70	
Metal reinforcement, 21,444.0 lbs. at 4c	857.76	
Structural steel, 91,635.8 lbs. at 4½c	4,123.61	
Lumber, 18.191 M-FBM at $60.00	1,091.46	
Trestle superstructure, 196.34 lin. ft. at $16.00	3,141.44	
Piling cut-off, 60.0 lin. ft. at 26c	15.60	
Force account items:		
Placing dowels into solid rock in pier No. 1	59.88	
Furnishing double length stringers to replace shorter lengths	132.68	
Constructing water stops at expansion joints	44.58	
Total amount paid to contractor		15,554.13
Grand total cost of structure, 1927-28		$16,727.73

PARTICIPATION IN COST

State	$ 8,950.66
County	7,777.07
Total	$16,727.73

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Santiam River Bank Protection

On the Pacific Highway at Jefferson, more particularly described as being on the west bank of the Santiam River about three-quarters mile above the Pacific Highway Bridge over the Santiam River at Jefferson; 0.4 mile of rock and earth filled driven pile crib, forming a dike. Grouted with reinforced concrete four inches thick. Work done by state forces.

Final cost, $26,818.07, consisting of $13,805.37 from state funds and $13,012.70 from railroad funds. Resident Engineers, W. K. Wright and A. A. Amort, successively.

As reported on page 374 of the 1923-1924 biennial report and on page 375 of the 1925-1926 biennial report, the original construction of this project was done between October 1, 1923, and January 15, 1924.

The work done on the project since that time has consisted of the general maintenance of the rock and earth fill pile crib dike, planting of willows and other shrubs and the paving with a four-inch thick reinforced slab of concrete the landside of the dike.

All work in connection with the construction and maintenance and betterment of this Santiam dike project has been carried on by the state with its own forces and equipment and the cost has been shared, or is under agreement to be shared, evenly between the state and the Southern Pacific Railroad Company.

W. K. Wright, Resident Engineer, Albany, Oregon, was in charge of the original construction work and the maintenance and betterment work has been done under the supervision of A. A. Amort, Resident Engineer, Corvallis, Oregon.

Further details will be found on page 375 of the 1925-26 report.

Maintenance

Save and except the maintenance on the projects built under the supervision of the U. S. Bureau of Public Roads for the first two year-period after their completion, all maintenance work on the state highway system in Linn County has been carried on by the state with its own forces and equipment. During this biennium the following highways have been maintained:

Pacific Highway, which is paved, Jefferson to Harrisburg; Santiam Highway, Albany to Shea's Hill, partly oiled and partly macadamized—in all aggregating a total distance of 63.3 miles.

This maintenance work has consisted of the general routine maintenance of roadbed, rights of way, drainage, ditches, surfaces, etc., and has been carried on under the direction of J. S. Sawyer, Division Engineer, Salem, Oregon, and A. A. Amort, Resident Engineer, Corvallis, Oregon.

Shea's Hill-Cascadia Maintenance Materials

On the Santiam Highway, at Sta. 1395 of the Shea's Hill-Cascadia section; 2,000 cubic yards of three-quarter-inch crushed rock maintenance material in stock pile. Materials furnished from May 10, 1928, to May 31, 1928, by R. W. Shaffer, contractor.

Final cost, $3,489.63, from state funds. Resident Engineer, E. E. Umphlette.

[LINN]

In connection with the surfacing of the Shea's Hill-Cascadia section of the Santiam Highway being done by Contractor R. W. Shaffer for the U. S. Bureau of Public Roads, an agreement was made whereby the state purchased from Mr. Shaffer 2,000 cubic yards of three-quarter-inch crusher run maintenance material, which was stock piled along the side of the highway about one-third mile west of the quarry site and three and one-half miles west of Cascadia. The material in question was made from the same hard, basalt rock that was used in the bureau's surfacing project. The production of this stock pile material was carried on under the direction of E. E. Umphlette, Resident Engineer, Lebanon, Oregon.

Albany-Lebanon Survey

In our report covering the 1925-1926 biennium the following report of the Albany-Lebanon survey was carried:

> "In preparation for awarding a contract for grading and surfacing the Santiam Highway between Albany and Lebanon, location surveys were started April 6, 1925, under the direction of E. E. Umphlette, Resident Engineer. A total of 12.56 miles were located, and the survey was finished during June, 1925. A contract for the construction of the section was awarded on July 28, 1925."

Since the completion of that survey, and the completion of the grading and macadamizing, it was found advisable to make additional surveys and set right of way monuments throughout the length of the line.

Survey work and the setting of these monuments was done during May, 1928, by E. E. Umphlette, Resident Engineer, Lebanon, Oregon.

Lebanon-Shea's Hill Survey

From February 1, 1927, to June 26, 1927, the final location survey of the Lebanon-Shea's Hill section of the Santiam Highway was made by E. E. Umphlette, Resident Engineer, Lebanon, Oregon, with a small party.

This location survey was made with the idea in mind of securing a high type direct route from Lebanon to the connection with the previously constructed Shea's Hill section and varies materially in many places from the route of the old county road.

At the time this report was written the grading of this section is practically completed and a contract has been awarded for the surfacing.

Albany-Cascadia Line Change Survey

During December, 1927, and January, February and March of 1928, at the application of the Linn County Logging and Lumber Railway Company, now the Oregon Electric Railroad, a relocation survey of the Santiam Highway at the "Narrows," which section of the highway was under contract to the Slate Construction Company for grading, was made.

This survey involved the relocation of one and two-tenths miles of the highway by moving it southward up the hill paralleling the Santiam River a sufficient distance to permit the construction of a railroad between the highway and the Santiam River, the cost of the survey being borne by the railroad interests.

Field work on this survey was done under the direction of E. E. Umphlette, Resident Engineer, Lebanon, Oregon, with a small party.

[LINN]

Shea's Hill-Forest Boundary Survey

During the fall and winter of 1925 and 1926 the final location survey of the Santiam Highway between the upper, or east end, of the Shea's Hill section, approximately three and one-half miles east of Foster, and the Santiam Forest Boundary, approximately two miles east of Cascadia, was made. This location follows up along the south bank of the Santiam River and at many places follows the stream very closely, and, when the highway is constructed, will afford many wonderful views of this beautiful stream. The total length of the survey is 10 miles, of which approximately six and six-tenths miles between Shea's Hill and Cascadia is under construction at the present time, through a cooperative agreement between the Bureau of Public Roads and Linn County.

During April and May, 1928, at the request of the United States Bureau of Public Roads and in addition to the 10-mile location survey between Shea's Hill and the Forest Boundary, a preliminary survey was run from the Forest Boundary to the Cascadia Ranger station, a distance of approximately one mile.

The field work on these surveys was done under the direction of E. E. Umphlette, Resident Engineer, Lebanon, Oregon.

Santiam Highway Forest Road Location

During 1925 a location survey was made by the Bureau of Public Roads on what is known as the Seven Mile Hill section. This survey was paid for from forest development funds. The location made at that time was approximately 12 miles in length and contemplated a development on the slopes of Seven Mile Hill. In 1928 a survey was authorized from the Cascadia Ranger station through to an intersection with the highway between Sisters and Black Butte. This survey is now in progress and at the present time is approximately 75 per cent complete. The location is being handled by J. W. Gilmore, Locating Engineer for the Bureau of Public Roads.

The total estimated cost of the work is $20,073.90, to be paid entirely from government funds. The expenditures to date amount to $18,715.20.

MALHEUR COUNTY

The northeast corner of Malheur County is the gateway from Idaho and the east to the State of Oregon. The Old Oregon Trail enters the state at Ontario with connections from Idaho across the Snake River at Nyssa, Payette, Weiser and Olds Ferry.

In pioneer days the Snake River Valley was followed westward by the early travelers toward the Oregon country; high mountains and deep canyons to the north and south preventing the development of other routes. These barriers have prevented the opening of other interstate highways along the eastern border of the state.

Three Oregon trans-state highways meet at this gateway; the Old Oregon Trail, John Day and Central Oregon Highways. Construction work on the Old Oregon Trail was completed in previous years. On the John Day Highway the grading was completed during 1925-1926, and 25.1 miles of surfacing were finished during the 1927-1928 biennium. Six and one-tenth miles of this were constructed several years ago and were revised during the biennium to a higher standard. It will be necessary to revise the section from Vale to Brogan within a few years as the traffic is increasing. On the Central Oregon Highway approximately six miles west of Vale were completed in previous years. Surveys have been completed on the west of this section for several miles. The Owyhee Irrigation Project will develop considerable additional farm acreage and construction of the highway through this section will be necessary. At the west side of the county several routes have been under investigation.

All work in this county during the past biennium has been under the direction of H. G. Smith, Division Engineer.

Weiser and Payette Spurs Grading and Surfacing

On the Weiser and Payette spurs, from the Old Oregon Trail to Weiser and the Old Oregon Trail to Payette, Idaho; 3.56 miles of grading and surfacing, 20 feet of roadbed and 16 feet of macadam.

Contract No. 755, awarded July 29, 1924, to W. E. Storm, of Weiser, Idaho. Work commenced September 17, 1924; completed October 7, 1925. Final cost, $32,556.66, from state funds. Resident Engineer, H. G. Smith.

This project has been opened during the biennium only to record final payment of $1,730.80 to the contractor.

Further details will be found on page 378 of the 1925-26 report.

Unity-Ironside Surfacing

Federal Aid Project No. 116-A

On the John Day Highway, from the town of Unity, in Baker County, to Ironside, in Malheur County, on the south fork of Willow Creek; 19.2 miles of broken stone surfacing.

Contract No. 921, awarded September 28, 1926, to Joslin & McAllister, of Spokane, Washington. Work commenced March 21, 1927; completed November 1, 1927. Final cost, $77,901.68. Resident Engineers, J. E. Peck and W. C. Williams.

The completion of this surfacing contract with the two units to the south toward Vale completed the John Day Highway from Arlington to a junction with the Old Oregon Trail near Ontario.

Further details will be found on page 377 of the 1925-26 report.

[MALHEUR]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,979.46
Quarry site leased and purchased		334.75
Lease of stock pile sites		250.00
Reconstructing irrigation ditches and culverts		87.86
Sprinkling surfacing materials		2,585.16
Contract items as follows:		
Base course surfacing, 18,805.0 cu. yds. at $1.68	$31,592.40	
Top course surfacing, 18,920.0 cu. yds. at $1.68	31,785.60	
Maintenance materials, 4,180.8 cu. yds. at $1.10	4,598.88	
Earth filler, 5,918.0 cu. yds. at 23c	1,361.14	
Filler haul, 4,230.5 yd. mi. at 20c	846.10	
Maintenance material haul, 1,515.2 yd. mi. at 20c	303.04	
Force account items:		
Removing or covering mud developed in subgrade	107.28	
Clearing roadway of material deposited by high water	70.01	
Total amount paid to contractor		70,664.45
Grand total cost of project		$77,901.68

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$ 21.77	$	$ 21.77
Expended 1927-28 biennium	31,962.44	45,917.47	77,879.91
Total of expenditures	$31,984.21	$45,917.47	$77,901.68

Ironside-Cow Valley Surfacing

Federal Aid Project No. 116-B

On the John Day Highway, from a point approximately one mile east of the south fork of Willow Creek to a point approximately six miles west of Brogan; 16.6 miles of surfacing.

Contract No. 883, awarded May 25, 1926, to Kibler & Bartlett, of Albany, Oregon. Work commenced July 10, 1926; completed August 15, 1927. Final cost, $74,641.67. Resident Engineer, J. E. Peck.

The surfacing on this section, together with a short section on the south toward Vale and one to the north, completed the surfacing of the John Day Highway. Approximately 50 per cent of this section was completed in the previous biennium.

Further details will be found on page 378 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5,226.46
Lease of filler pit from Eastern Oregon Land Co.		25.00
Fencing filler pit		113.00
Sprinkling surface materials		927.40
Contract items as follows:		
Base course surfacing, 15,537.0 cu. yds. at $1.75	$27,189.75	
Top course surfacing, 15,586.0 cu. yds. at $1.75	27,275.50	
Maintenance materials, 3,801.8 cu. yds. at $1.25	4,752.25	
Grade "A" filler, 9,986.0 cu. yds. at 40c	3,994.40	
Grade "B" filler, 3,656.0 cu. yds. at 40c	1,462.40	
Filler haul, 12,210.5 yd. mi. at 20c	2,442.10	
Superelevation embankment, 3,067.5 cu. yds. at 30c	920.25	
Channel change excavation, 320.0 cu. yds. at 30c	96.00	
Force account:		
Removing oversize rock from filler materials	217.16	
Total amount paid to contractor		68,349.81
Grand total cost of project		$74,641.67

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$16,198.59	$	$16,198.59
Expended 1927-28 biennium	18,559.10	39,883.98	58,443.08
Total of expenditures	$34,757.69	$39,883.98	$74,641.67

[MALHEUR]

Cow Valley-Brogan Surfacing

Federal Aid Project No. 17

On the John Day Highway from a point approximately six and one-half miles west of the town of Brogan to a point near the west town limits of Brogan; 6.1 miles of widening curves and fills, extending culverts and headwalls, and crushed rock surfacing.

Contract No. 1,025, awarded December 20, 1927, to Joslin & McAllister, of Spokane, Washington. Work commenced January 25, 1928; completed May 17, 1928. Final cost, $41,262.52. Resident Engineer, W. C. Williams.

The grading of this section was completed in May, 1920, and the roadbed materials were of such nature that surfacing was not considered necessary. However, when the other units adjoining this section were surfaced, the increased traffic indicated that some changes in alignment, widening of fills, lengthening of culverts and surfacing were necessary. This section completed the John Day Highway.

Detailed Statement of Expenditures

Engineering		$ 2,489.30
Sprinkling surfacing materials		907.84
Signs for traffic control		9.16
Extending concrete box culverts by state force work		1,344.66
Contract items as follows:		
Common excavation, 1,912.4 cu. yds. at 60c	$ 1,147.44	
Intermediate excavation, 1,160.1 cu. yds. at 60c	696.06	
Solid rock excavation, 3,041.2 cu. yds. at $1.00	3,041.20	
Common embankment, 4,643.8 cu. yds. at 30c	1,393.14	
Overhaul, 1,770 yd. sta. at 5c	88.50	
Dry rubble, 10.92 cu. yd. at $6.00	65.52	
12-inch corrugated galvinized iron pipe, 60 lin. ft. at $1.70	102.00	
18-inch corrugated galvanized iron pipe, 42 lin. ft. at $2.60	109.20	
24-inch corrugated galvinized iron pipe, 26 lin. ft. at $3.00	78.00	
Salvaging and reinstalling 12-inch pipe, 26 lin. ft. at 40c	10.40	
Base course surfacing, 8,255.0 cu. yds. at $1.85	15,271.75	
Top course surfacing, 6,520.0 cu. yds. at $1.85	12,062.00	
Maintenance materials, 1,524.3 cu. yds. at $1.29	1,966.35	
Earth filler, 750.0 cu. yds. at 30c	225.00	
Filler haul, 1,275.0 yd. mi. at 20c	255.00	
Total amount paid to contractor		36,511.56
Grand total cost of project, 1927-28		$41,262.52

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended to date	$41,262.52	$	$41,262.52
Estimated cost to complete	Cr. 22,364.10	22,364.10	
Estimated total costs	$18,898.42	$22,364.10	$41,262.52

Beam Creek-Lost Valley Grading

Federal Aid Project No. 116-B

On the John Day Highway from a point in Malheur County 1.65 miles south of the Baker-Malheur County line to Lost Valley, approximately three and three-quarters miles east of the south fork of Willow Creek; 11.65 miles of grading, 24-foot roadbed.

Contract No. 823, awarded June 25, 1925, to Drummie, Brown & Toller, of Downey, Idaho. Work commenced July 10, 1925; completed March 14, 1926. Final cost, $99,615.48. Resident Engineers, H. G. Smith and J. E. Peck, successively.

[MALHEUR]

This project has been opened during the present biennium only to record the receipt of $7,500 in final cooperation by Malheur County. The total cost now consists of $28,971.34 from state funds, $10,631.25 from county funds and $60,012.89 from government funds.

Further details will be found on page 381 of the 1925-26 report.

Lost Valley-Cow Valley Grading

Federal Aid Project No. 116-B

On the John Day Highway from Lost Valley, approximately three and three-quarter miles east of the south fork of Willow Creek to Cow Valley in T. 15 S., R. 41 E.; 8.63 miles of grading, 24-foot roadbed.

Contract No. 811, awarded May 28, 1925, to Henry C. Boyer, of Ontario, Oregon. Work commenced July 13, 1925; completed December 14, 1925. Final cost, $36,240.23. Resident Engineers, H. G. Smith and J. E. Peck, successively.

This project has been opened during the present biennium only to record the receipt of $15,000 as final cooperation by Malheur County. The final cost now consists of a credit of $1,263.87 to state funds, $15,000 from county funds, and $22,504.10 from government funds.

Further details will be found on page 380 of the 1925-26 report.

Maintenance

At the close of the 1927-1928 biennium there are 121.01 miles of state highways under maintenance, of which 58.28 miles are oil treated macadam, 61.83 miles untreated macadam and 0.90 mile concrete pavement.

The section from the Baker County line to the Payette Spur is in charge of H. A. Haines with headquarters at the Snake River Patrol station. From the Payette Spur to Nyssa, Cairo to Vale, Vale to Burrelle Ranch and Ontario to the Idaho state line is in charge of Barney L. Bull, patrolman, with headquarters at Ontario. The section from the Baker-Malheur County line south of Unity to the south end of Cow Valley is in charge of Patrolman Frank Lund with headquarters at Ironside. The section from Cow Valley to Vale was in charge of Virgil M. Smith and Cyril W. Crawley, patrolmen, successively.

On the Old Oregon Trail from the Baker County line to Nyssa and on the John Day Highway from Vale to Cairo, crushed maintenance materials had become exhausted and in order that maintenance work might not be hindered 18,458.5 cubic yards of materials were crushed.

Certain classes of work such as oiling, reoiling, reconstructing culverts and ditches were placed in charge of special foremen with extra gangs. Extra gang foremen were Roland Hopper, F. B. Hurt and I. I. Basey. J. N. Bishop was Resident Maintenance Engineer with headquarters at Baker, who reports to H. G. Smith, Division Engineer, at La Grande. R. H. Baldock is State Maintenance Engineer with headquarters at Salem, Oregon.

Ontario-Nyssa and Vale-Cairo Maintenance Materials

On the Old Oregon Trail and John Day Highways, from Ontario to Nyssa and Vale to Cairo; 24.17 miles of maintenance materials in stock piles.

[MALHEUR]

Contract No. 930, awarded October 26, 1926, to H. T. Hildeburn, of Portland, Oregon. Work commenced April 5, 1927; completed July 18, 1927. Final cost, $25,843.18. Resident Engineer, J. N. Bishop.

The materials crushed under this contract were used for maintenance and oiling.

Further details will be found on page 382 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 525.94
Purchase of gravel pits		835.94
Lease of stock pile sites		46.00
Contract items as follows:		
Grade "A" crushed gravel, 2,893.3 cu. yds. at $1.85	$ 5,352.61	
Grade "B" crushed gravel, 9,870.2 cu. yds. at $1.35	13,324.77	
Hauling crushed gravel, 23,031.66 yd. mi. at 25c	5,757.92	
Total amount paid to contractor		24,435.30
Grand total cost of project, all state funds, 1927-28		$25,843.18

Snake River Patrol House

On the Old Oregon Trail Highway, 24 miles north of Ontario.

In 1923 patrol headquarters were established at this point, a house and other improvements being constructed. During the past biennium other improvements were made by state forces from the bridge department under the direction of M. Stephenson, Bridge Maintenance Engineer.

Further details will be found on page 381 of the 1925-26 report.

Harper-Burns Survey

J. E. Peck and W. C. Williams, Resident Engineers, have from time to time since 1926, as they found opportunity to do so, made preliminary line surveys at certain points and general reconnaissance at others of the various possible routes that might be used on the Central Oregon Highway from Harper in Malheur County to Burns in Harney County. Particular attention has been directed to the section from Juntura to the Harney Valley. A preliminary line was run from the end of the Buchanan-Nigger Flat section to Drewsey which indicates that a practical route can be secured over Stinking Water Mountain. Additional work was done between Drewsey and Juntura. See page 384 of the 1925-1926 report for other information.

Vale-Jamieson Survey

During the winter of 1927 and the spring of 1928 a survey was made along the John Day Highway from Jamieson to Vale for the purpose of estimating the cost of reconstructing this section to a modern grading standard and a modern surface. The surfacing on this section was originally constructed to a width of only eight feet and the need for resurfacing is becoming apparent.

The section between Brogan and Jamieson should be brought to a standard at the same time as the surfacing on this section was constructed only 12 feet in width.

MARION COUNTY

As at the close of the preceding biennium, there is nothing to report of new construction upon the state highway system in Marion County, it having been entirely completed during the preceding biennium and there having been nothing undertaken in the way of major betterment during the two-year period just ended.

Maintenance work has included some experimental non-skid treatment upon bituminous pavement in the vicinity of Aurora in 1927 as a result of which it is planned to treat in a similar manner the entire section of the Pacific Highway in Marion County north of Salem during 1929.

All work in Marion County north of Salem has been handled under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem. The work south of Salem has been handled under the supervision of J. S. Sawyer, Division Engineer, with headquarters also at Salem.

Concrete Deck on Salem Bridge

On the Salem-Dallas Highway, in Salem.

Contract No. 973, awarded May 24, 1927, to Lindstrom & Feigenson, of Portland, Oregon. Work commenced June 1, 1927; completed August 24, 1927. Final cost, $25,280.81. Resident Engineers, C. H. Darby and Christ Fauerso.

In order to do this work with the least inconvenience to traffic, one-half of the width of the roadway was paved at a time, thus allowing one way traffic on the other half. Extra strength concrete was used in order that the bridge could be put back in service in the shortest possible time.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,287.43
Labor and materials furnished by state:		
Providing watchmen and traffic signals		855.87
Catch basins, boxes and grates		170.60
Drilling castings used for reinforcing stringer bearings		9.82
Red lead paint used in force account work		13.22
Asphalting plank connection to Polk County approach		14.86
Contract items as follows:		
Concrete, 671.92 cu. yds. at $20.00	$13,438.40	
Metal reinforcement, 168,804.0 lbs. at $3.75	6,330.15	
Removal of deck and maintenance of traffic, all	2,500.00	
Dummy expansion joints, 37.0 each at $7.50	277.50	
Force account items:		
Building flagman's house	74.74	
Scraping and painting top cord	183.82	
Replacing rotted sidewalk and traffic planks	187.53	
Placing castings to reinforce stringer bearings	118.03	
Planking connection of new slab with Polk County approach	80.62	
Total amount earned by contractor	$23,190.79	
Deductions:		
Cement adjustment, 98.25 bbls. at $2.41	236.78	
For removing forms	25.00	
Total amount paid to contractor		22,929.01
Grand total cost of project, all state funds, 1927-28		$25,280.81

[MARION]

Mill Creek Bridge

On the Pacific Highway, in Salem; 193 feet R. C. viaduct.

Contract awarded to Lindstrom & Feigenson of Portland, Oregon. Final cost, $43,925.36, from city funds. Resident Engineer, R. A. Furrow, City Engineer.

This bridge was constructed by the city of Salem and replaces a wooden trestle which was rapidly becoming dangerous to traffic.

In order to get the new bridge, which carries the highway through Salem, under construction as soon as possible after bonds were authorized, the Highway Commission agreed to make the design and bill the city for the cost.

Maintenance

Division No. 1

Aside from the ordinary and continued operations of maintenance of drainage and roadbed, repair to pavement surface, etc., the only item of special interest in the maintenance operations during 1927-1928 in Marion County has been the experimental work in the way of bituminous macadam resurface and non-skid treatment which was done in and near Aurora in 1927. For a detailed discussion of the specifications under which this work was done reference is made to the special section on maintenance in this report, but it may be said in general that the bituminous macadam resurface consisted of a road mix which was laid by method of processing with a blade grader resulting in a bituminous macadam approximately one and one-quarter inches thick, using Gasco No. 2 road binder as the binding element in the macadam. This redress was placed over the pavement for a distance of approximately two-tenths mile through the main street of the town of Aurora and was extended to constitute a widening of the pavement to a width of approximately 24 feet. Immediately south from this bituminous macadam section a non-skid treatment, extending over about one mile, was put down as a trial, continuing the experiment begun in 1926 in Tillamook County, in the effort to evolve a method by which the bituminous pavements might be made less slippery in wet weather and therefore safer. This non-skid treatment was put down in Aurora in 1927 and consisted simply of an application of No. 2 Gasco road binder on the pavement and the addition of screenings which were roled in. The resulting surface has been very satisfactory in accomplishing the object desired and it is expected that a similar process will be continued over the Pacific Highway as far as Salem in 1929.

Maintenance work in Division No. 1 in Marion County has been under the field direction of F. T. Young, Resident Engineer, with headquarters at Oregon City, until March 26, 1928, and since that date under F. D. Eason, Resident Engineer, with headquarters at McMinnville. The general supervision of the work has been handled by W. D. Clarke, Division Engineer, with headquarters at Salem.

Division No. 2

On the state highway south of Salem, general patrol and maintenance has been carried on by the state and covers 15.6 miles of the Pacific Highway, all of which is paved.

This work has been done under the supervision of J. S. Sawyer, Division Engineer, Salem, Oregon, and A. A. Amort, Resident Engineer, Corvallis, Oregon.

MORROW COUNTY

The state highway system in Morrow County consists of the Old Oregon Trail from east to west across the extreme north end of the county near the Columbia River, and the Oregon-Washington Highway which enters the county near the northwest corner extending in a southeasterly direction to Heppner, the county seat, near the center of the county; thence nearly directly east to the east boundary of the county.

The construction of the Old Oregon Trail, both grading and surfacing, was completed in previous years. The grading on the Oregon-Washington Highway was completed during the 1925-1926 biennium and the surfacing was completed during 1927-1928.

The surfacing work consisted of 14.95 miles on the Oregon-Washington Highway from the Umatilla County line to a point west of Little Butter Creek.

All work in this county is under the supervision of H. G. Smith, Division Engineer, of La Grande, Oregon.

Jones Hill-Lena Surfacing

On the Oregon-Washington Highway, from a point approximately three miles west of Lena to a point approximately 0.05 mile east of the west fork of Butter Creek at Lena; 2.88 miles of surfacing.

Contract No. 931, awarded October 26, 1926, to Albert L. Smith, of Heppner, Oregon. Work commenced March 10, 1927; completed January 20, 1928. Estimated cost, $13,000. Resident Engineers, E. B. Loken, C. E. Carter and W. W. Stiffler, successively.

The surfacing of this section with the two units to the east completed the Oregon-Washington Highway from Heppner Junction on the Old Oregon Trail to the Washington state line south of Walla Walla, Washington.

Further details will be found on page 387 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,258.34
Maintaining completed sections of surfacing		407.65
Sprinkling surfacing materials		366.82
Contract items as follows:		
Base course surfacing, 2,653.0 cu. yds. at $1.58	$ 4,191.74	
Top course surfacing, 2,394.0 cu. yds. at $1.58	3,782.52	
Grade "A" maintenance materials, 311.28 cu. yds. at $1.58	491.82	
Grade "B" maintenance materials, 921.71 cu. yds. at $1.40	1,290.39	
Grade "C" maintenance materials, 106.13 cu. yds. at $1.40	148.58	
Stripping filler pits, 381.5 cu. yds. at 25c	95.38	
Earth filler, 1,946.0 cu. yds. at 25c	486.50	
Filler haul, 1,723.5 yd. mi. at 20c	344.70	
Force account item:		
Picking rock from filler	8.83	
Total amount earned by contractor	$10,840.46	
Less final estimate in process of payment	525.86	
Total amount paid to contractor		10,314.60
Grand total expended to date		$12,347.41

PARTICIPATION IN COST

	State	*County*	*Total*
Total expended to date	$1,875.27	$10,472.14	$12,347.41
Estimated balances to complete	Cr. 75.27	727.86	652.59
Estimated total cost	$1,800.00	$11,200.00	$13,000.00

[MORROW]

Lena-Umatilla County Line Surfacing

On the Oregon-Washington Highway, from a point 0.05 mile east of the west fork of Butter Creek at Lena to the Morrow-Umatilla County line; 11.1 miles of surfacing.

Contract No. 931, awarded October 26, 1926, to Albert L. Smith, of Heppner, Oregon. Work commenced March 10, 1927; completed January 20, 1928. Estimated cost, $54,000. Resident Engineers, E. B. Loken, C. E. Carter and W. W. Stiffler.

This section with the one to the west and the one to the east in Umatilla County completed the Oregon-Washington Highway.

Further details will be found on page 388 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,541.83
Purchasing rock quarry		200.00
Widening roadbed		70.51
Prospecting for surfacing materials		24.00
Sprinkling surfacing materials		2,782.59
Labor and equipment rentals deducted from contractor's estimate		365.00
Contract items as follows:		
Sub-base course surfacing, 2,935.0 cu. yds. at $1.48	$ 4,343.80	
Base course surfacing, 9,571.0 cu. yds. at $1.58	15,122.18	
Top course surfacing, 9,479.0 cu. yds. at $1.58	14,976.82	
Grade "A" maintenance materials, 992.91 cu. yds. at $1.58	1,568.80	
Grade "B" maintenance materials, 3,175.61 cu. yds. at $1.40	4,445.85	
Grade "C" maintenance materials, 106.12 cu. yds. at $1.40	148.57	
Stripping filler pits, 2,724.4 cu yds. at 25c	681.10	
Earth filler, 10,408.5 cu. yds. at 25c	2,602.13	
Filler haul, 12,578.5 yd. mi. at 20c	2,515.75	
Force account items:		
Picking rock from earth filler	153.03	
Building up shoulders to macadam	607.40	
Total amount earned by contractor	$47,165.43	
Deductions:		
Labor and blading equipment furnished by state	365.00	
Less final estimate in process of payment	1,037.16	
Total amount paid to contractor		45,763.27
Grand total expended, 1927-28		$52,747.20

PARTICIPATION IN COST

	State	*County*	*Total*
Total expended to date	$22,508.15	$30,239.05	$52,747.20
Estimated balance to complete	1,252.80	.....	1,252.80
Estimated total cost	$23,760.95	$30,239.05	$54,000.00

West Unit, Lena-Vinson Grading

On Oregon-Washington Highway, from the east end of the Jones Hill-Lena section near Lena on the west fork of Butter Creek to the Morrow-Umatilla County line; 11.1 miles of grading.

Contract No. 855, awarded October 27, 1925, to John Hampshire, of Grants Pass, Oregon. Work commenced November 10, 1925; completed October, 1926. Final cost, $111,862.56. Resident Engineer, E. B. Loken.

The grading of this section completed the grading of the Oregon-Washington Highway in Morrow County, and with the unit in Umatilla County to the east completed the grading of the Oregon-Washington Highway throughout its entire length.

Further details will be found on page 388 of the 1925-26 report.

[MORROW]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 9,548.28
Payment to Wm. Instone in lieu of constructing cattle pass		400.00
Contract items as follows:		
Clearing and grubbing, all	$ 1,500.00	
Common excavation, 29,646.3 cu. yds. at 20c	5,929.26	
Intermediate excavation, 34,497.2 cu. yds. at 45c	15,523.74	
Solid rock excavation, 57,016.96 cu. yds. at $1.05	59,867.81	
Overhaul, 23,572.0 yd. sta. at 5c	1,178.60	
18-inch concrete pipe, 1,851.0 lin. ft. at $3.00	5,553.00	
24-inch concrete pipe, 693.0 lin. ft. at $4.00	2,772.00	
36-inch concrete pipe, 284.0 lin. ft. at $7.00	1,988.00	
Class "B" concrete, 14.414 cu. yds. at $34.00	490.08	
Riprap, 64.2 cu. yds. at $2.50	160.50	
Dry rubble, 244.58 cu. yds. at $3.50	856.03	
Dry rubble haul, 366.59 yd. mi. at 35c	128.31	
Lumber and timber, 10.43 M-FBM at $70.00	730.10	
Earth cushion, 4,601.0 cu. yds. at 45c	2,070.45	
Earth cushion haul, first mile, 4,601.0 yd. mi. at 25c	1,150.25	
Earth cushion haul, second mile, 177.5 yd. mi. at 20c	35.50	
Fresnoed earth cushion, 3,026.0 cu. yds. at 60c	1,815.60	
Force account items:		
Removing oversize rock from cushion materials	165.05	
Total amount paid to the contractor		101,914.28
Grand total cost of project		$111,862.56

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$61,125.96	$40,000.00	$101,125.96
Expended 1927-28 biennium	10,736.60		10,736.60
Total of expenditures	$71,862.56	$40,000.00	$111,862.56

Maintenance

At the close of the 1927-1928 biennium there are 94.17 miles of state highway under maintenance in Morrow County, of which 67.81 miles are oiled macadam and 26.36 miles are of untreated macadam.

The portions oiled are the Old Oregon Trail across the north boundary, and the Oregon-Washington Highway from the Gilliam County line to Heppner. The untreated section extends from Heppner east to the Umatilla County line on the Oregon-Washington Highway.

The Old Oregon Trail was reoiled with a higher type of surface treatment and the Oregon-Washington Highway from the Gilliam County line to the east city limits of Heppner was oil-surface treated during this biennium.

There were 49,028.1 cubic yards of crushed material manufactured for maintenance purposes.

The oiling was done by special crews of men under extra gang foremen. F. W. Churchill was foreman in 1927 and D. B. Cooper in 1928.

The maintenance section from Heppner Junction to the Umatilla County line on the Old Oregon Trail was in charge of E. T. Messenger, with headquarters at Boardman. On the Oregon-Washington Highway from the Gilliam County line to Lexington, W. Sexton was patrolman with headquarters at Ione, and J. M. Coblantz, patrolman, with headquarters at Heppner, was in charge of the section from Lexington to the Umatilla County line.

C. E. Carter was Resident Maintenance Engineer, with headquarters at Pendleton. H. G. Smith, Division Engineer at La Grande, has general supervision of maintenance. R. H. Baldock is State Maintenance Engineer with headquarters at Salem.

[MORROW]

Heppner Junction-Ione Maintenance Materials

On the Oregon-Washington Highway from Mile Post 3.6 to Mile Post 26.0, approximately three miles north of Ione; 22.4 miles of maintenance materials in stock piles.

Contract No. 1,015, awarded November 29, 1927, to J. W. and J. R. Hillstrom, of Marshfield, Oregon. Work commenced March 1, 1928; completed August 22, 1928. Final cost, $20,471.94. Resident Engineer, C. E. Carter.

The materials provided in this contract are for general maintenance, new oiling and oil maintenance.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,233.94
Purchase of rock quarry and stock pile sites		411.50
Preparation of stock pile sites		145.87
Contract items as follows:		
Grade "A" materials in stock pile, 3,634.5 cu. yds. at $1.55	$ 5,633.48	
Grade "B" materials in stock pile, 6,607.6 cu. yds. at $1.55	10,241.78	
Grade "C" materials in stock pile, 2,167.9 cu. yds. at $1.55	3,360.25	
Grade "A" materials in trucks, 99.0 cu. yds. at $1.10	108.90	
Grade "B" materials in trucks, 94.0 cu. yds. at $1.10	103.40	
Broken stone haul, 40 yd. mi. at 18c	7.20	
Total amount earned by contractor	$19,455.01	
Deduction for haul adjustment	774.38	
Total amount paid to contractor		18,680.63
Grand total cost of project, all state funds, 1927-28		$20,471.94

Ione-Heppner Maintenance Materials

On the Oregon-Washington Highway, from Mile Post 26.0, approximately three miles north of Ione, to Mile Post 49.0, near the east city limits of Heppner; 23 miles of maintenance materials in stock piles.

Contract No. 939, awarded January 27, 1927, to Carl T. Habekost, of Gearhart, Oregon. Work commenced April 15, 1927; completed October 31, 1927. Final cost, $26,377.27. Resident Engineer, C. E. Carter.

The maintenance materials furnished when this section was originally surfaced had become exhausted and in order to provide materials for general maintenance, oiling and oil maintenance, this contract was let.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,179.43
Purchase of McMurray and Blahm quarry sites		175.00
Preparation of stock pile sites		6.30
Contract items as follows:		
Grade "A" materials in stock piles, 2,507.5 cu. yds. at $2.25	$ 5,641.88	
Grade "B" materials in stock piles, 8,622.7 cu. yds. at $2.00	17,245.40	
Grade "C" materials in stock piles, 511.1 cu. yds. at $1.10	562.21	
Grade "B" materials in trucks, 401.0 cu. yds. at $1.20	481.20	
Extra haul (truck measure), 267.25 yd. mi. at 18c	48.11	
Extra haul (pile measure), 4,717.0 yd. mi. at 22c	1,037.74	
Total amount paid to contractor		25,016.54
Grand total cost of project, all state funds, 1927-28		$26,377.27

[MORROW]

Jones Hill Resurfacing

On the Oregon-Washington Highway, from the top of Jones Hill to near Lena on west fork of Butter Creek; 0.97 mile of resurfacing.

Supplementary agreement to contract No. 931, awarded November 16, 1927, to Albert L. Smith, of Heppner, Oregon. Work commenced November 20, 1927; completed December 1, 1927. Estimated cost, $1,300 from state funds. Resident Engineer, W. W. Stiffler.

The resurfacing of this section was let as a supplement to general contract No. 931 as it was thought advisable to take advantage of the fact that the contractor had crushing equipment in the vicinity.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5.70
Contract items as follows:		
Base course surfacing, 215.0 cu. yds. at $2.00	$ 430.00	
Top course surfacing, 395.0 cu. yds. at $2.00	790.00	
Earth filler, 32 cu. yds. at 25c	8.00	
Filler haul, 46 yd. mi. at 20c	9.20	
Total amount earned by contractor	$1,237.20	
Less final estimate in process of payment	162.30	
Total amount paid to contractor		1,074.90
Grand total expended, all state funds, 1927-28		$1,080.60

MULTNOMAH COUNTY

The status of highway work in Multnomah County remains the same at the date of this report as heretofore, all such work being done by the county through its own highway organization, since the Multnomah County roads which form parts and connecting links of the state highway system are, in reality, not legally state highways. Just at the close of the period covered by this report there is a proposal under consideration by the State Highway Commission and the county commissioners of Multnomah County for the taking over by the state of some of these connecting links in Multnomah County as state highways, thereby imposing upon the state the expense of their future maintenance. This proposition has not been fully determined upon, nor the exact details of the matter worked out.

POLK COUNTY

Division No. 1

As noted in the report of the work during 1925-1926, the state highway system in Polk County was completed in that biennium, with the exception of a short gap at Holmes Gap on the West Side Pacific Highway, in addition to which a reconstruction of a short section at Valley Junction on the McMinnville-Tillamook Highway has also been done. Aside from these two minor improvements, state highway work in the county has been confined entirely to ordinary maintenance operations, the bituminous macadam or oiling work which has been done being classed as betterments.

Work in Polk County north of Rickreall and including the Salem-Dallas Highway has been handled by W. D. Clarke, Division Engineer, with headquarters at Salem, Oregon.

Division No. 2

No new state highway construction work in that part of Polk County south of the Salem-Dallas Highway in this division has been done this biennium, the state highway system having been completed and reported as such in our past reports. Some minor betterment work in the nature of widening the grade on the West Side Pacific Highway at the Orr's Corners south of Rickreall has been completed, thereby obtaining a much needed improvement.

All state highway construction and betterment work in the southern part of the county has been carried on under the direction and supervision of J. S. Sawyer, Division Engineer, Salem, Oregon, and A. A. Amort, Resident Engineer, Corvallis, Oregon.

Valley Junction Bridge Approaches Grading and Surfacing

On the McMinnville-Tillamook Highway, from Mile Post 25.05, at Sta. 12+00, which station is approximately 540 feet west of the crossing of the Willamina and Grande Ronde Railroad near Valley Junction, east to Mile Post 25.79, at Sta. 27+00, which station is approximately one-half mile east of Valley Junction, through an equation Sta. 0+00 west equals Sta. 0+00 east at the intersection with the Salmon River survey, which point is 37 feet from the west end of the new bridge; 0.74 mile of grading and broken stone surfacing.

Contract No. 1,043, awarded May 29, 1928, to Frank M. Bullis, of Corvallis, Oregon. Work commenced June 12, 1928; completed September 2, 1928. Final cost $14,879.56. Resident Engineer B. O. Johnson.

In connection with the construction of a new bridge over the Yamhill River at Valley Junction in Polk County, a betterment of the highway for a distance of about a quarter mile north and a half mile east from the bridge has been made. This betterment consisted of regrading upon a revised alignment and grade to provide the best possible approaches to the new bridge, particularly at its westerly end where the situation is affected by the Willamina & Grande Ronde Railroad track and the grade crossing over it, and also to elevate the roadbed over the low section for a distance of a few hundred feet east of the bridge where the highway has frequently been overflowed by water from the Yamhill River.

[POLK]

This work was done under contract, as noted above, in the summer of 1928, and immediately following completion of the grading the section was surfaced with broken stone macadam, for which the rock had been furnished and stocked by the Motor Investment Company in connection with its contract for crushing maintenance materials at the Wirth quarry located at the westerly end of the section, with the labor of placing being performed by the grading contractor.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,086.00
Purchase of right of way		1,972.55
Moving buildings from right of way		1,610.95
Hauling and constructing surfacing		960.15
Sprinkling surfacing materials		698.28
Preparing stock pile sites		66.78
Preparing subgrade		17.23
Contract items as follows:		
Clearing and grubbing, all	$ 25.00	
Excavation, single classification, 11,817.8 cu. yds. at 36c	4,254.41	
Overhaul, 4,106.0 yd. sta. at 5c	205.30	
Truck haul, 5,546.0 yd. mi. at 20c	1,109.24	
12-inch concrete pipe, 102 lin. ft. at 90c	91.80	
18-inch concrete pipe, 45 lin. ft. at $1.95	87.75	
24-inch concrete pipe, 12 lin. ft. at $2.85	34.20	
Surfacing materials in place, 3,007.0 cu. yds. at 75c	2,255.25	
Clay filler, 520 cu. yds. at 45c	234.00	
Filler haul, 520 yd. mi. at 25c	130.00	
Force account items:		
Removing 12-inch pipe under crossroads	4.72	
Removing approaches to old bridge	13.85	
Removing fence to give access to borrow pit and replacing same	14.44	
Removing oversize rock from surfacing	7.66	
Total amount paid to contractor		8,467.62
Grand total cost of project, all state funds, 1927-28		$ 14,879.56

Holmes Gap Grading and Surfacing

On the West Side Pacific Highway, from Mile Post 53.68, at Sta. 444+98, which station is approximately eight miles south of the town of Amity, south to Mile Post 54.04, at Sta. 464+14, which station is approximately five miles north of the town of Rickreall; 0.36 mile of grading, 40-foot standard roadbed.

Contract No. 964, awarded March 29, 1927, to Earl L. McNutt, of Eugene, Oregon. Work commenced April 20, 1927; completed July 8, 1927. Final cost, $7,399.93. Resident Engineer, F. D. Eason.

The Holmes Gap section on the West Side Pacific Highway is a stretch of about one-half mile, located five miles north of Rickreall, where construction of the paved highway was deferred until a separation of grade with the Southern Pacific track could be made. The grade crossing there has been the scene of a number of serious accidents due to the sharp turn that formerly existed leading from a stretch of highway running immediately adjacent to and parallel with the railroad right-of-way, and turning directly across the track at right angles. In the early part of 1927 a betterment of this situation was made by a regrading of the section, on a realignment following for about a third of the distance southerly from the north end of the gap along the ultimate line for the overcrossing and for

[POLK]

the remainder of the distance along the existing road with slight revisions. The work included construction of a new trestle over a small creek and a resurfacing of the section with a crushed gravel macadam for which material was shipped from Salem.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 823.70
Purchase of right of way for new line		100.00
Sprinkling of surfacing materials		117.65
Credit by sale of salvaged materials from old bridge		Cr. 50.00
Lumber furnished contractor and deducted from his estimate		37.54
Contract items as follows:		
Clearing and grubbing, all	$ 25.00	
Excavation, single classification, 3,292.0 cu. yds. at 39c	1,283.88	
Excavation, special agreement, 820.0 cu. yds. at 78c	639.60	
Overhaul, 2,680.0 yd. sta. at 5c	134.00	
12-inch concrete pipe (unplaced) 51.0 lin. ft. at $1.25	63.75	
Class "B" concrete, 17,635 cu. yds. at $30.00	529.05	
Lumber and timber, 10.498 M-FBM at $65.00	682.37	
Sub-base course surfacing, 450.0 cu. yds. at $1.90	845.50	
Base course surfacing, 260.0 cu. yds. at $2.15	559.00	
Top course surfacing, 334.0 cu. yds. at $2.40	801.60	
Earth filler, 189.5 cu. yds. at 75c	142.13	
Filler haul, 189.5 yd. half mi. at 10c	18.95	
Base course maintenance materials, 100.0 cu. yds. at $2.00	200.00	
Top course maintenance materials, 215.0 cu. yds. at $2.25	483.75	
Total amount earned by contractor	$ 6,408.58	
Deduction for lumber furnished by the State	37.54	
Total amount paid to contractor		6,371.04
Grand total cost of project, all state funds, 1927-28		$ 7,399.93

Grande Ronde Temporary Surfacing

On the Salmon River Road, from Sta. 96+50, near the Grande Ronde store at New Grande Ronde, west to Sta. 205+00, near Stewart's Mill; 2.05 miles of temporary surfacing laid in one course four inches thick, seven and one-half feet wide on top feathered to eight and one-half feet wide on the bottom.

Contract No. 991, awarded July 28, 1927, to the Motor Investment Company, of Portland, Oregon. Work commenced August 29, 1927; completed October 26, 1927. Final cost, $4,690, from improvement district funds. Resident Engineer, F. D. Eason.

This is a contract of the Salmon River-Grande Ronde Highway Improvement District advertised in accordance with the law by the State Highway Commission. It covers the construction of a temporary rock surfacing on the easterly two miles of that section of the Salmon River Road which was graded in 1927, which surfacing was necessary to permit local residents along that section of the road to have an outlet during the winter, since the old road had been largely destroyed by construction of the new. The material used for the surfacing was crushed rock obtained from the Wirth quarry at Valley Junction. Contractors for this work at the same time having an operation under way at that quarry for furnishing maintenance materials on the state highway.

[POLK]

Tillamook County Line-Grande Ronde Grading

On the Salmon River Road, from Sta. 431+80, which station is at the Tillamook-Polk County line, east to Sta. 96+50, which station is near Old Grande Ronde and 1.82 miles west of Valley Junction; 6.36 miles of grading, 24-foot standard roadbed.

Contract No. 963, awarded March 29, 1927, to O. D. Wolfe, of Washougal, Washington. Work commenced April 28, 1927; completed October 28, 1927. Final cost, $85,146.82. Resident Engineer, F. D. Eason.

The biennial report for 1925-1926 on pages 393-4 records the formation of the Grande Ronde-Salmon River Highway Improvement District and the survey of the proposed route of the Grande Ronde-Salmon River road from Valley Junction westerly through New Grande Ronde and Boyer to Lincoln County east of Otis. In September, 1926, bids were received for the grading of the six-mile section of this road from New Grande Ronde to the Tillamook County line near Boyer. Litigation involving the constitutionality of the Highway Improvement District law delayed the awarding of the contract until March, 1927, but the contract was finished and the road graded by October, 1928.

The low bid on this project at the bidding in September, 1926, was submitted by Archie Mason of Portland, but before the situation was cleared for the award of the contract Mr. Mason died and the contract was ultimately awarded to O. D. Wolfe upon a readvertisement calling for bids on March 29, 1927, at which time he presented the lowest bid.

This project provides a roadway of state highway standard as to grade and alignment, though, from reasons of economy imposed by the limited funds available, the roadbed width was restricted to 24 feet on the more level sections from New Grande Ronde westerly to the foot of the supported grade, a distance of approximately 1.6 miles, and to 24 feet in excavation and 22 feet in embankment on the hill section comprising the westerly approximately 4.7 miles.

Further details will be found on page 393-4 of the 1925-26 report.

Ash Creek Bridge

On the West Side Pacific Highway, just north of Monmouth.

Contract No. 1,023, awarded November 29, 1927, to O. N. Pierce Company, of Portland, Oregon. Work commenced August 7, 1928; completed October 31, 1928. Estimated cost, $3,000 from state funds. Expenditures to date, $2,409.68. Resident Engineer, J. T. Skelton.

This job was completed but the final settlement has not yet been made at the end of the biennium.

Luckiamute River Bridge

Federal Aid Project No. 57

On the West Side Pacific Highway, at Helmick Station; one 100-foot steel span and five 40-foot concrete spans.

Contract No. 1,022, awarded November 29, 1927, to O. N. Pierce Company, of Portland, Oregon. Work commenced January 18, 1928; com-

[POLK]

pleted October 31, 1928. Estimated cost, $39.000. Resident Engineer, J. T. Skelton.

This bridge replaces one of the most dangerous structures on the state highway system. The old bridge was being used as a detour bridge during construction of the new structure. Shortly before completion of the new structure the detour bridge failed under a heavily loaded truck. By planking over the new concrete, traffic was carried with very little delay. Quicksand was encountered on the approach footings, necessitating a change in design which will entail an adjustment with the contractor. Final settlement has not yet been made on this job.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,301.98
Labor and materials furnished by state:		
Bronze name plates		26.01
Constructing guard fence		71.78
Traffic signs and provisions for control of traffic		555.03
Constructing embankment approaches		402.00
Contract items as follows:		
Excavation, 739.4 cu. yds. at $2.50	$ 1,848.50	
Excavation, below plan elevation, 122.2 cu. yds. at $4.00	488.80	
Fir piling, 607.3 lin. ft at 40c	242.92	
Class "A" concrete, 256.93 cu. yds. at $20.00	5,138.60	
Class "B" concrete, 193.65 cu. yds. at $20.00	3,873.00	
Class "D" concrete, 203.92 cu. yds. at $20.00	4,078.40	
Metal reinforcement, 119,788.0 lbs. at 4c	4,791.52	
Structural steel, 123,422.0 lbs. at 6½c	8,022.43	
Concrete handrail, 410.6 lin. ft. at $5.00	2,053.00	
Removal of old bridge and maintenance of traffic, lump sum	2,500.00	
Force account items:		
Building job office for state use	21.39	
Constructing sheet copper water stops over piers No.1 and No. 2 in concrete deck	32.54	
Placing strap stiffeners on end posts of steel handrail	13.89	
Total amount earned by contractor	$33,104.99	
Deductions:		
Cement adjustment under-run	34.58	
Retained percentage	4,107.76	
Total amount paid to contractor		28,962.65
Grand total expended on structure, 1927-28		$ 32,319.45

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended to date	$20,878.65	$11,440.80	$32,319.45
Estimated cost to complete	Cr. 4,457.25	11,137.80	6,680.55
Total estimated costs	$16,421.40	$22,578.60	$39,000.00

Falls City-Valsetz Highway Improvement District

During 1927 citizens residing in the western part of Polk County and the eastern part of Lincoln County desired to establish a highway improvement district, submitted their form of petition and asked for the State Highway Commission's approval of the same. Thereafter a regular hearing was held and later a rehearing, all of which developed many facts which convinced the State Highway Commission that the boundaries and form of petition should not be approved, and, therefore, at the meeting on May 14, 1927, the commission entered a formal order denying and disapproving the district.

[POLK]

Valley Junction Bridge

On the McMinnville-Tillamook Highway, over the Yamhill River at Valley Junction; one 100-foot steel span and two 22-foot concrete spans.

Contract No. 1,011, awarded October 25, 1927, to Clackamas Construction Company, of Portland, Oregon. Work commenced December 12, 1927; completed April 10, 1928. Final cost $18,584.87. Resident Engineer, C. K. Hubbard.

This bridge replaces a light timber span on the same site. The alignment is planned to provide a suitable connection to both the McMinnville-Tillamook Highway and the Salmon River Road.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,422.16
Bronze name plates for bridge		15.45
Contract items as follows:		
Removal of old bridge and maintenance of traffic	$ 1,000.00	
Excavation, 246.0 cu. yds. at $2.00	492.00	
Class "A" concrete, 44.29 cu. yds. at $21.00	930.09	
Class "B" concrete, 106.92 cu. yds. at $17.00	1,817.64	
Class "D" concrete, 107.95 cu. yds. at $21.00	2,266.95	
Metal reinforcement, 38,093.0 lbs. at 4.25c	1,618.95	
Structural steel, 120,856.0 lbs. at 7c	8,459.92	
Concrete handrail, 100.0 lin. ft. at $4.00	400.00	
Purchase of detour bridge, lump sum	150.00	
Force account items:		
Patching hole in deck of steel bridge over Yamhill River one-half mile east	11.71	
Total amount paid to contractor		17,147.26
Grand total cost of project, all state funds, 1927-28		$ 18,584.87

Maintenance

Division No. 1

Work by the maintenance forces of the state during 1927 and 1928 on the state highways in Polk County, in addition to the routine operations of drainage and roadbed maintenance, repairs of signs, guard fences, etc., and the moderate amount of pavement patching which has been necessary, has consisted of the following items of a maintenance or minor betterment nature:

The redress of a short section of the Salem-Dallas Highway immediately east of Brunk's Corner with plant-mixed bituminous macadam;

The redress of approximately one and one-half miles of the McMinnville-Tillamook Highway west of its junction with the West Side Pacific Highway south of McMinnville. This work consisted of several sections of different types described in more detail in the general section of this report covering maintenance, including a section of plant-mixed bituminous macadam using 95 per cent asphaltic oil;

A section of road-mixed bituminous macadam using 95 per cent asphaltic oil and short sections of plant-mixed bituminous macadam using Grade "D" and Grade "E" asphalt;

The experimental oiling of the gap in the pavement at Holmes Gap, using "Bitumuls";

The construction of bituminous macadam surfacing on the Willamina-Valley Junction section of the McMinnville-Tillamook Highway.

[POLK]

Maintenance operations in Polk County have been under the field direction of F. D. Eason, Resident Engineer, with headquarters at McMinnville. General supervision of the work has been handled by W. D. Clarke, Division Engineer, with headquarters at Salem.

Division No. 2

The maintenance done in Polk County in this division consists of the general routine maintenance of the West Side Pacific Highway from Rickreall to the Benton County line, a distance of 15.2 miles, and has been carried on under the supervision of J. S. Sawyer, Division Engineer, Salem, Oregon, and A. A. Amort, Resident Engineer, Corvallis, Oregon.

Wirth Quarry Maintenance Materials

On the McMinnville-Tillamook Highway, at the Wirth quarry, which quarry is near the McMinnville-Tillamook Highway and opposite Mile Post 25, approximately three miles east of Grande Ronde. Furnishing of two grades of broken stone, Grade "A," which is three-quarters-inch to dust material, and Grade "B," which is one and one-half-inch to three-quarters-inch material.

Contract No. 884, awarded May 25, 1926, to W. C. Elliott, of Portland, Oregon. Work commenced July 7, 1926; completed November 6, 1926. Final cost, $15,853.37. Resident Engineer, J. C. Russell.

Work under this contract, as described on pages 392-3 of the report for 1925-1926, consisted in furnishing maintenance materials from the Wirth quarry about three miles east of Grande Ronde. The job was practically complete at the close of the preceding biennium and expenditures made in the present biennium have been only the final payment to the contractor and for royalties.

Further details will be found on page 392 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 444.02
Lease of Wirth quarry		300.00
Items deducted from the contractor's estimate:		
Fuel oil furnished by the state		198.00
Rental of state-owned equipment		315.75
Inspection expense account of overrun of time limit		120.00
Contract items as follows:		
Grade "A" broken stone in bunkers, 6,235.5 cu. yds. at $2.00	$12,471.00	
Grade "B" broken stone in bunkers, 1,353.0 cu. yds. at $1.95	2,638.35	
Total amount earned by contractor	$15,109.35	
Deductions:		
Fuel oil, 3,300.0 gal. at 6c	198.00	
Rental of state-owned equipment	315.75	
Inspection expense	120.00	
Total amount paid to contractor		14,475.60
Grand total cost of project, all state funds		$ 15,853.37

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$12,101.41
Expended 1927-28 biennium	3,751.96
Total of expenditures	$15,853.37

[POLK]

Sarah Helmick Park Site

A beautiful park site, approximately six acres in area adjacent to the West Side Pacific Highway and on the west side of the highway bordering the Luckiamute River on the south, was donated to the State Highway Commission in 1924 by Mrs. Sarah Helmick for use as a public park.

Since the donation of this site temporary development work has been done from time to time, which consisted of the clearing of the underbrush, the trimming of trees, the installation of wells to provide drinking water, and the general maintenance of the park grounds. A few tables and and benches and outdoor stoves and fireplaces have been provided for the convenience of lunch and picnic parties.

Maintenance and betterment work has been done by state forces and equipment operating under the supervision of A. A. Amort, Resident Engineer, Corvallis, Oregon.

Valley Junction Survey

In connection with the reconstruction of the Yamhill River bridge, on the McMinnville-Tillamook Highway at Valley Junction in Polk County, a relocation of the highway was made with the special purpose of improving the approach to the new bridge at its west end. This survey was made in December, 1927, and January, 1928, under the direction of G. S. Gray, Resident Engineer, beginning at the crossing over the Willamina and Grande Ronde Railroad at Mile Post 21.15 just west of the bridge, and extending a distance of 0.81 mile to the second crossing of the Yamhill River at Mile Post 25.95.

New Grande Ronde-Old Grande Ronde Survey

In December, 1926, a survey was made from New Grande Ronde, on the route of the line of the Salmon River road survey, to a point just west of Old Grande Ronde on the present McMinnville-Tillamook Highway. The total distance surveyed was 1.95 miles, of which 1.57 miles is in Polk and 0.38 mile in Yamhill County.

The purpose of this survey was to secure information regarding the practicability of that connection as a possible route for the McMinnville-Tillamook Highway in lieu of the present route from Valley Junction via Butler's Store and Old Grande Ronde. It was not made in preparation for any definitely contemplated change in the routing of that highway, but was one of two surveys which were undertaken to furnish accurate information as to all the practicable routes between Dolph and Valley Junction.

The survey was made by F. D. Eason, Resident Engineer.

Salmon River Road Survey

The survey of the Valley Junction-Lincoln County line section of the Salmon River road made by the State Highway Commission at the request of the directors of the Grande Ronde-Salmon River Highway Improvement District in accordance with the highway improvement district law, was completed during the preceding biennium and is described on page 372 of the biennial report for 1925-1926. Expenditures during the current biennium have been only for minor delayed charges from the preceding years.

SHERMAN COUNTY

There has been no new construction of state highways within this county during the past biennium. The work has been for the most part confined to maintenance of existing oiled surfacing of the Columbia River Highway through Sherman County and of the Biggs-Wasco section of the Sherman Highway. New oil was applied on the section of the Sherman Highway from Wasco to Grass Valley in 1927, and was completed to approximately two miles south of Kent in 1928, resulting in the major portion of the state highway system in Sherman County being oiled macadam, some sections of which are excellent examples of this character of roadway.

Contracts were awarded during the biennium for the getting out of materials to be used in maintenance work both on the Columbia River and Sherman Highways.

All state work within the county was handled under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend.

John Day River Bridge Reconstruction

On the Columbia River Highway, between Sherman and Gilliam Counties; two 127-foot steel spans and two 40-foot concrete spans replacing existing timber construction.

Contract No. 907, awarded July 29, 1926, to Lindstrom & Feigenson, of Portland, Oregon. Work commenced August 30, 1926; completed April 22, 1927. Final cost, $50,363.46. Resident Engineer, Christ Fauerso.

Further details will be found on page 397 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,987.11
Credit for used lumber sold to county		Cr. 37.44
Signs for traffic control		9.19
Contract items as follows:		
Excavation, 80.96 cu. yds. at $1.50	$ 121.29	
Class "A" concrete, 93.86 cu. yds. at $23.25	2,182.25	
Class "D" concrete, 287.85 cu. yds. at $23.25	6,692.51	
Metal reinforcement, 74,955.0 lbs. at 4.5c	3,372.98	
Structural steel, 333,005.0 lbs. at 7c	23,310.35	
Concrete handrail, 1,003.0 lin. ft. at $4.50	4,513.50	
Removal of old bridge and maintenance of traffic, all	6,000.00	
Special adjustment, account of alteration in construction	692.36	
Force account items:		
Maintaining deck of old bridge until temporary bridge was opened to traffic	44.88	
Providing filler plates under expansion armor joints	66.64	
Placing copper water stops at junction of old steel span with new concrete approaches	65.28	
Furnishing three standard concrete guard fence posts	13.55	
Installing dummy expansion joints over each intermediate steel floor beam	90.00	
Painting one coat on old steel trusses	197.51	
Cutting steel stringers where necessary for expansion	41.50	
Total amount paid to the contractor		47,404.60
Grand total cost of structure, all state funds		$ 50,363.46

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 7,758.75
Expended 1927-28 biennium	42,604.71
Total of expenditures	$50,363.46

[SHERMAN]

Maintenance

The Columbia River Highway in Sherman County, which was first oiled in 1924, has been oiled practically each season since, resulting in the preservation of the macadam surfacing at a saving in cost. The Sherman Highway was oiled from Biggs to Wasco in 1926, and has required no additional oiling since that time. These two sections have required the usual maintenance accorded to oiled sections. The balance of the Sherman Highway, with the exception of the short section extending from a point approximately two miles south of Kent to the Wasco County line which has not been oiled, has been given an oiled surface. The unit from Wasco to Grass Valley was first oiled in 1927, and the remainder from Grass Valley to a point approximately two miles south of Kent, was oiled in 1928. Contracts were awarded for the furnishing of suitable materials for use in the maintenance and oiling of these sections, the same having been hauled out and stock-piled at points most convenient for use. Due to chinook wind conditions and quick melting of snow in the vicinity between Moro and the Columbia River Highway during the spring of 1928, the highway was flooded and considerable damage done to the roadway, necessitating the addition of materials for both the roadbed and surfacing.

Work within the county is handled by Resident Maintenance Engineer K. D. Lytle, at The Dalles.

Dillon-Quinton and Biggs-Wasco Maintenance Materials

On the Columbia River and Sherman Highways.

Contract No. 946, awarded January 28, 1927, to M. Chandler & Co., of The Dalles, Oregon. Work commenced March 1, 1927; completed June 30, 1927. Final cost, $20,518.53. Resident Engineer, K. D. Lytle.

The work consisted of the furnishing of crushed gravel for use by the state in connection with maintenance operations on the Dillon-Quinton section of the Columbia River Highway in the counties of Gilliam, Sherman and Wasco and the Biggs-Wasco section of the Sherman Highway in Sherman County. The major portion of the materials were stock-piled at points designated by this department, the balance having been delivered into state trucks at the bunkers. The materials were secured from the Fulton and Deyo pits.

Detailed Statement of Expenditures

Engineering		$ 1,467.15
Purchase of the Deyo gravel pit		503.50
Fencing gravel pit		127.10
Contract items as follows:		
Crushed gravel in stock pile, 12,498.6 cu. yds. at 68c	$ 8,499.05	
Crushed gravel in trucks, 1,871.5 cu. yds. at 68c	1,272.62	
Hauling gravel, pile measurement, 48,476.0 yd. mi. at 18c	8,649.11	
Total amount paid to contractor		18,420.78
Grand total cost of project, all state funds, 1927-28		$ 20,518.53

[SHERMAN]

Moro-Kent Maintenance Materials

On the Sherman Highway, on the Moro-Kent section.

Contract No. 1,018, awarded November 29, 1927, to A. S. Wallace, of Roseburg, Oregon. Work commenced February 13, 1928; completed October 10, 1928. Estimated cost $31,000 from state funds. Resident Engineer, A. A. Kirkwood.

This work consisted of furnishing maintenance materials for use in connection with the maintenance operations on the Moro-Kent section of the Sherman Highway in Sherman County.

The major portion of the materials were stock-piled at convenient points designated by this department the balance having been delivered into state trucks at the bunkers, which were located, one near the north limits of Grass Valley, being four-tenths of a mile east and two-tenths of a mile south from Mile Post 27.1 and one at the Finnegan quarry, located 100 feet east of the highway at Mile Post 35.9, about five miles north of the town of Kent.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,130.26
Lease of stock pile sites		95.00
Lease of quarry site		250.00
Signs for traffic control		16.00
Contract items as follows:		
Grade "A" materials in stock pile, 4,490.4 cu. yds. at $1.90	$ 8,531.76	
Grade "B" materials in stock pile, 6,644.3 cu. yds. at $1.70	11,295.31	
Grade "C" materials in stock pile, 5,003.2 cu. yds. at $1.45	7,254.64	
Grade "A" materials in trucks, 143.0 cu. yds. at $1.40	200.20	
Grade "B" materials in truck, 357.5 cu. yds. at $1.20	429.00	
Grade "C" materials in trucks, 140.0 cu. yds. at 95c	133.00	
Truck haul, 1,947.2 yd. mi. at 18c	350.50	
Force account items:		
Preparing stock pile sites	270.52	
Total amount earned by contractor	$28,464.93	
Deductions:		
Haul adjustment	873.26	
Final estimate in process of payment	3,713.20	
Total amount paid to contractor		23,878.47
Grand total expended on project, all state funds, 1927-28		$ 26,369.73

John Day River Bridge Approaches Embankment

On the Columbia River Highway, at the west end of the John Day River bridge; 40 lineal feet of embankment to connect up to the new John Day River bridge.

Contract No. 951, awarded March 3, 1927, to O. S. Bergh, of Portland, Oregon. Work commenced March 21, 1927; completed April 15, 1927. Final cost $1,632.75. Resident Engineer, K. D. Lytle.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 148.21
Contract items as follows:		
Embankment in place, 3,092.8 cu. yds. at 48c		1,484.54
Total cost of project, all state funds, 1927-28		$ 1,632.75

TILLAMOOK COUNTY

The two-year period just ended has seen the practical completion of the Roosevelt Coast Highway through Tillamook County. Grading and surfacing of the section between Mohler and Hobsonville, which was just getting under way at the beginning of the biennium, has been completed. There now remains only two short gaps where structures are to be built for an overcrossing over the Southern Pacific track at Juno and for a new bridge over the Wilson River which, with the construction of a new bridge over the Trask River, a contract for which is being let just at the close of the year, will complete the state's highway system in the county.

Several major betterment projects, including a two-mile revision in the route of the highway south from the city of Tillamook and the regrading and paving of the Moore Cut-off section have been under consideration, but as yet no work has been undertaken on either project.

State work in the county has been handled under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem.

Jetty Creek-Brighton Grading

On the Roosevelt Coast Highway, from Mile Post 57.74 at Sta. 951+00, which station is approximately 2,000 feet south of the depot at Jetty, north to Mile Post 56.74, Sta. 1003+80, which station is opposite the Brighton Lumber Mill at Brighton; one mile of grading, 28-foot standard roadbed.

Contract No. 732, awarded May 28, 1924, to the United Contracting Company, of Portland, Oregon. Work commenced June 26, 1924; completed December 15, 1924. Estimated cost, $78,000, consisting of $53,000 from state funds and $25,000 from county funds. Expenditures to date, $76,491.07, composed of $51,491.07 from state funds and $25,000 from county funds. Resident Engineer, G. S. Gray.

As noted in the description of this project on page 400-401 of the biennial report for 1925-1926, the contractors had filed a suit for an adjudication of the final estimate just prior to the end of the year 1926. The complaint in this action alleged a number of deficiencies in the State Highway Engineer's final estimate and made claim for sums aggregating approximately $54,000. Actual trial of the suit did not begin until October, 1928, and at the close of the present year the closing arguments of the case in the court of original jurisdiction have not yet been made, although the presentation of the evidence in the case was completed October 11.

Expenditures during the biennium just ended have been confined entirely to costs in connection with the litigation.

Further details will be found on page 400-401 of the 1925-26 report.

Wheeler Grading and Surfacing

Federal Aid Project No. 129-A

On the Roosevelt Coast Highway, from Mile Post 52.23, at Sta. 1349+65, which station is approximately 1,100 feet north of the north end of the overhead crossing over the Southern Pacific Railroad, south to Mile Post 53.96, at Sta. 1144+00, which station is approximately six-

[TILLAMOOK]

tenths of a mile south of Wheeler; 1.73 miles of grading and broken stone surfacing. The surfacing was laid 16 feet wide on top, feathered to 20 feet wide in two courses; one course of one and one-half-inch to three-quarters-inch base material four inches thick, and one course of three-quarters-inch to dust material used as a dressing.

Contract No. 875, awarded April 29, 1926, to Lair & Co., of Kelso, Washington. Work commenced May 7, 1926; completed December 15, 1926. Final cost, $64,244. Resident Engineer, G. S. Gray.

Further details will be found on page 399 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,041.33
Labor and material furnished by the state:		
Cleaning ditches and culverts and repairing washouts		145.90
Installing six catch basin grates		78.00
Repair work on Wheeler overcrossing		50.52
Constructing work guard fence		150.00
Installing drainage flumes along fills		222.74
Sprinkling surfacing materials		183.18
Removing slides		177.39
Credit for rock transferred to maintenance account	Cr.	492.80
Contract items as follows:		
Clearing and grubbing, all	$1,000.00	
Extra clearing and grubbing, 0.842 acres at $500.00	421.00	
Class "A" excavation, 13,373.6 cu. yds. at 53c	7,088.01	
Class "B" excavation, 10,294.2 cu. yds. at 65c	6,691.23	
Class "C" excavation, 11,195.2 cu. yds. at 80c	8,956.16	
Class "D" excavation, 27,785.7 cu. yds. at 34c	9,447.14	
Borrow excavation, 890.3 cu. yds. at 55c	489.67	
Overhaul, 225,062.0 yd. sta. at 3c	6,751.86	
6-inch porous drain tile, 920.0 lin. ft. at 24c	220.80	
8-inch concrete pipe, 134.5 lin. ft. at $1.05	141.23	
12-inch concrete pipe, 585.0 lin. ft. at $1.10	643.50	
36-inch concrete pipe, 234.0 lin. ft. at $6.50	1,521.00	
Class "A" concrete, 73,396.0 cu. yds. at $35.00	2,568.86	
Class "C" concrete, 13.17 cu. yds. at $32.00	421.44	
Metal reinforcement 7,570.0 lbs. at 8c	605.60	
Rock backfill for drains, 151.0 cu. yds. at $2.50	377.50	
Lumber and timber, 12.971 M-FBM at $40.00	518.84	
Timber piling in trestles, 1,518.0 lin. ft. at $1.20	1,821.60	
Base course surfacing, 2,652.5 cu. yds. at $2.65	7,029.13	
Top course surfacing, 388.0 cu. yds. at $2.75	1,067.00	
Base course maintenance materials, 112.0 cu. yds. at $2.50	280.00	
Top course maintenance material, 100.0 cu. yds. at $2.60	260.00	
Maintenance material in bunkers, 200.0 cu. yds. at $1.50	300.00	
Haul on bunker material, 964.0 yd. mi. at 20c	192.80	
Earth filler, 93.0 cu. yds, at 50c	46.50	
Force account items:		
Removing and replacing water mains	291.24	
Replacing sewer with new pipe	1,045.72	
Removing and reconstructing plank approach roads	197.36	
Placing shoring in 36-inch pipe for protection against fill settlement	33.40	
Constructing temporary plank surfacing	136.33	
Installing wooden gutters along fills	122.82	
Total amount paid to contractor		60,687.74
Grand total cost of project		$64,244.00

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$35,028.79	$15,000.00	$	$50,028.79
Expended 1927-28 biennium	Cr. 23,987.00	8,901.14	29,301.07	14,215.21
Total of expenditures	$11,041.79	$23,901.14	$29,301.07	$64,244.00

[TILLAMOOK]

Mohler-Garibaldi Surfacing

Federal Aid Project No. 129-D

On the Roosevelt Coast Highway, in two units. The north unit extends from Sta. 1416, which station is 400 feet north of the bridge over the south fork of the Nehalem River at Mohler, south to Sta. 1002, at Brighton, and is 5.68 miles in length. The south unit extends from Sta. 765+60 at Rockaway, south to Sta. 547 near Garibaldi and is 4.14 miles in length. The distance between the two units is 4.18 miles; 9.82 miles of broken stone surfacing.

Contract No. 987, awarded July 28, 1927, to the Newport Construction Company, of Portland, Oregon. Work commenced August 17, 1927. Estimated cost, $136,000, consisting of $98,104.90 from state funds, $34,800 from county funds, and $3,095.10 from government funds. Expenditures to date, $120,340.50, from state funds. Resident Engineers, until April, 1928, A. J. Olsen; after April, 1928, B. O. Johnson.

Although the grading of the Rockaway-Garibaldi section was not yet completed, a contract for surfacing that section in conjunction with the surfacing of the Mohler-Brighton section, and the partial resurfacing of the Brighton-Rockaway section was let in July, 1927. Grading of the Mohler-Brighton section having been completed it was absolutely necessary, in order to permit traffic to reach the Rockaway vicinity during the winter of 1927-1928, over certain parts of the Wheeler-Brighton section, where the old road had been destroyed and traffic must necessarily traverse the new grade, that such sections of new grade be rocked. Since it was anticipated that surfacing material for the entire stretch of highway from Mohler to Garibaldi would be taken from the Haddon quarry located near the middle of the section, it was decided to contract the surfacing of the whole distance as one project upon a two-year basis, which would provide for rocking in the fall of 1927 the sections which must be traveled during the following winter and completion of the surfacing after completion of the grading south of Rockaway.

This was done and the surfacing has been completed with a macadam 18 feet wide and 10 inches in depth. This macadam consists of three courses: A sub-base course of five inches of 3″-¾″ broken stone, a base course of three inches of 1½″-¾″ material, and a top course of two inches of ¾″ to 0″ screenings. Most of this material was secured from the Haddon quarry with the sub-base material and part of the base course rock for the southerly 4.14 miles from Watseco to Garibaldi, coming from a quarry near Smith's Point south of Barview.

The construction of the macadam has been completed during the year just ended but by reason of an increase in the quantity of maintenance material being furnished, final settlement of the contract has not been made at the date of this report. The original contract provided for but a small amount of maintenance material, but because of the anticipated need for additional rock for use in connection with oiling at an earlier date than was expected when the contract was written, and in view of the offer of the contractors to furnish the desired material at a more favorable price than could be expected upon any other arrangement since the contractors had their quarry and crushing plant already in operation, while any other arrangements would have necessarily involved the extra cost

[TILLAMOOK]

of plant installation and preliminary overhead which was not included in the price agreed upon, it was decided to substantially increase the amount of maintenance materials to be furnished.

Approximately 20,000 cubic yards of oil rock conforming to the usual specifications for such material are being furnished at $1.10 per cu. yd. at the bunkers with haul at 15c per cu. yd. for the first mile and 7½c per cu. yd. for each half mile over the first mile. This work will be completed early in 1929.

Garibaldi-Hobsonville Surfacing

Federal Aid Project No. 129-C

On the Roosevelt Coast Highway, from Mile Post 65.81, at Sta. 547+00, which station is approximately one-half mile north of the town of Garibaldi, south to Mile Post 69.04, at Sta. 365+00, which station is approximately one and eight-tenths of a mile north of Bay City; 3.45 miles of crushed gravel surfacing laid in three courses: A sub-base course of 2½"-0" crushed gravel five inches thick, a base course 1½"-0" crushed gravel three inches thick and top course of ¾"-0" crushed gravel two inches thick, 18 feet wide and trenched.

Contract No. 981, awarded June 23, 1927, to Harness and Colby, of Roseburg, Oregon. Work commenced July 26, 1927; completed October 7, 1927. Final cost, $20,900.60. Resident Engineer, A. J. Olsen.

Surfacing of the Garibaldi-Hobsonville section was put under contract immediately upon the completion of the grading of the section in June, 1927. For the surfacing, crushed gravel from the Miami River was used, being secured from a bar about three-quarters of a mile up-stream from the crossing of the highway. Specific data as to thickness, width, number of courses, etc., of the macadam constructed are given above.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,027.75
Lease of the Charles Blum gravel bar		350.00
Sprinkling surfacing materials		117.84
Hauling gravel on road from bar by state forces		509.05
Constucting guard fence		126.14
Additional surfacing purchased and placed in 1928		2,413.48
Sub-base materials furnished for adjacent section		Cr. 1,203.80
Contract items as follows:		
Sub-base course surfacing, 4,129.5 cu. yds. at $1.30	$5,368.35	
Base course surfacing, 3,597.0 cu. yds. at $1.35	4,855.95	
Top course surfacing, 2,152.0 cu. yds. at $1.60	3,443.20	
Base course maintenance materials, 862.2 cu. yds. at 80c	689.76	
Top course maintenance materials, 475.8 cu. yds. at $1.00	475.80	
Earth filler, 1,289.0 cu. yds. at 25c	322.25	
Filler haul, 1,258.0 yd. mi. at 25c	314.50	
Maintenance material haul, 2,935.36 yd. mi. at 20c	587.07	
Additional sub-base material, 926.0 cu. yds. at $1.30	1,203.80	
Force account items:		
Preparation of stock pile sites	299.46	
Total amount paid to contractor		17,560.14
Grand total cost of project, 1927-28		$20,900.60

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Total expended to date	$14,900.60	$ 6,000.00	$	$20,900.60
Estimated balances to complete	Cr. 9,794.84		9,794.84	
Estimated total costs	$ 5,105.76	$ 6,000.00	$ 9,794.84	$20,900.60

[TILLAMOOK]

Mohler-Wheeler Grading

Federal Aid Project No. 129-D

On the Roosevelt Coast Highway, from Mile Post 50.97, Sta. 1417+50, which station is approximately 500 feet north of the bridge over the south fork of the Nehalem River at Mohler, south to Mile Post 52.27, Sta. 1349+00, which station is approximately one mile north of Mohler; 1.30 miles of grading, 30-foot standard roadbed.

Contract No. 904, awarded July 28, 1926, to Hauser Brothers, of Portland, Oregon. Work commenced August 15, 1926; completed July 31, 1927. Final cost, $45,648.65. Resident Engineer, G. S. Gray.

The grading of the section was completed in July, 1927, and the stability of the fills and freedom of the roadbed from settlement since that time appear to have fully justified the slightly greater cost for the high land borrow fills which were chosen in prefernece to a dredged borrow.

Further details will be found on page 403 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 2,429.96
Removing slides and widening roadbed		4,663.84
Purchase of right-of-way		19.00
Building approach road to Rupp crossing		30.50
Building concrete culvert at Station 1398+75		1,039.41
Constructing Mohler overflow trestle		3,549.80
Constructing cattle pass		692.62
Constructing and maintaining detour road		88.90
Contract items as follows:		
Clearing and grubbing, all	$ 2,500.00	
Roadbed excavation, 10,079.6 cu. yds. at 35c	3,527.86	
Borrow excavation, 48,894.1 cu. yds. at 50c	24,447.05	
Overhaul, 6,354 yd. sta. at 5c	317.70	
12-inch concrete pipe, 152 lin. ft. at $2.50	380.00	
18-inch concrete pipe, 162 lin. ft. at $4.00	648.00	
36-inch concrete pipe, 66 lin. ft. at $7.50	495.00	
Class "C" concrete, 4.34 cu. yds. at $40.00	173.60	
Slide excavation, 862.6 cu. yds. at 50c	431.30	
Force account items:		
Placing temporary plank surfacing at road crossing	113.77	
Filling around cattle pass because of late completion of same	78.19	
Reshaping roadbed after winter settlement	22.15	
Total amount paid to contractor		33,134.62
Grand total cost of project		$45,648.65

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$10,917.91	$	$	$10,917.91
Expended 1927-28 biennium	4,599.22	13,651.20	16,480.32	34,730.74
Total expenditures to date	$15,517.13	$13,651.20	$16,480.32	$45,648.65
Estimated balance to complete	Cr. 5,299.68		5,299.68	
Estimated total cost	$10,217.45	$13,651.20	$21,780.00	$45,648.65

Wheeler-Brighton Grading

Federal Aid Project No. 129-E

On the Roosevelt Coast Highway, from Mile Post 53.9, Sta. 1147+00, which station is approximately one-half mile south and west of the town of Wheeler, south to Mile Post 56.76, Sta. 1002+00, which station is at Brighton; 2.86 miles of grading, 32-foot standard roadbed.

[TILLAMOOK]

Contract No. 917, awarded August 26, 1926, to John Hampshire, of Grants Pass, Oregon. Work commenced October 18, 1926; completed October 31, 1927. Final cost, $161,471.88. Resident Engineer, G. S. Gray.

Construction of the railroad grade to which the Southern Pacific track has been moved to permit construction of the highway upon the previous location of the track, was not completed during the winter of 1926-1927 as expected, but was finished in the summer of 1927. For this reason transfer of the track to the new grade was impracticable before the spring of 1928 because of the necessity of permitting the grade to settle. This delayed the actual final completion of the grading of the project until 1928, although the work done under the contract was finished and the contract terminated in the fall of 1927, the grading of that part of the project where the highway occupies the old railroad roadbed having been done by state forces.

Further details will be found on page 402-3 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5,206.96
Moving S. P. R. R. Co. track and appurtenances		473.42
Constructing culverts, tile drains and drainage ditches		1,258.78
Constructing guard fence		977.12
Placing riprap		180.22
Removing slides and cleaning ditches		14,991.82
Repairing washouts and widening roadbed		3,296.87
Contract items as follows:		
Clearing and grubbing, all specified	$11,000.00	
Extra clearing and grubbing, 4.47 acres at $400.00	1,788.00	
Class "A" excavation, 100,858.8 cu. yds. at 45c	45,386.46	
Class "B" excavation, 95,621.7 cu. yds. at 55c	52,591.94	
Culvert excavation, 1,911.8 cu. yds. at $1.00	1,911.80	
Overhaul, 247,304.0 yd. sta. at 2c	4,946.08	
12-inch concrete pipe, 916.0 lin. ft. at $1.50	1,374.00	
18-inch concrete pipe, 771.0 lin. ft. at $2.50	1,927.50	
24-inch concrete pipe, 556.0 lin. ft. at $3.50	1,946.00	
36-inch concrete pipe, 108.0 lin. ft. at $6.00	648.00	
6-inch porous drain tile, 460.0 lin. ft. at 20c	92.00	
Rock backfill for drains, 15.0 cu. yds. at $1.50	22.50	
Rubble masonry, 107.0 cu. yds. at $16.00	1,712.00	
Rock borrow, 5,150.5 cu. yds. at $1.00	5,150.50	
Culvert materials, 4.032 M-FBM at $30.00	120.96	
Force account items:		
Falling and removing dangerous trees and snags	360.55	
Hand placing rock along face of R. R. embankment	641.93	
Repair plank road in Brighton for detour road	210.46	
Removing logs, stumps, and cribbing in old fills	463.28	
Constructing culverts and outlets	1,214.71	
Constructing plank driveway to old county road	263.09	
Removing slide materials and reslope cuts	1,314.93	
Total amount paid to contractor		135,086.69
Grand total cost of project		$161,471.88

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$ 229.95	$	$	$ 229.95
Expended 1927-28 biennium	119,491.80		41,750.13	161,241.93
Total expended to date	$119,721.75	$	$ 41,750.13	$161,471.88
Estimated cost to complete Cr.	68,689.27	58,000.00	10,689.27	
Estimated total costs	$ 51,032.48	$ 58,000.00	$ 52,439.40	$161,471.88

[TILLAMOOK]

Miami River Bridge

Federal Aid Project No. 129-C

On the Roosevelt Coast Highway, near Garibaldi; one 100-foot steel truss span and two 20-foot concrete approach spans.

Contract No. 896, awarded June 24, 1926, to J. J. Badraun, of Portland, Oregon. Work commenced July 15, 1926; completed March 25, 1927. Final cost, $22,622.04. Resident Engineer, R. W. Archibald.

This structure is part of the line revision between Garibaldi and Bay City. It replaces a steel span which has since been moved to a new location on a Tillamook County road. The new alignment over this bridge eliminates two grade crossings over the Southern Pacific track.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,675.41
Painting guard rail		139.48
Name plates furnished by state		35.40
Finishing work by state forces		75.89
Contract items as follows:		
Excavation, 195.0 cu. yds. at $4.00	$ 780.00	
Concrete pile tops, 8 each at $82.40	659.20	
Wood piling, 1,176.4 lin. ft. at 60c	705.84	
Seal concrete, 77.94 cu. yds. at $20.00	1,558.80	
Class "A" concrete, 55.59 cu. yds. at $24.00	1,334.16	
Class "B" concrete, 73.0 cu. yds. at $25.00	1,825.00	
Class "D" concrete, 91.73 cu. yds. at $22.00	2,018.06	
Metal reinforcement, 36,851.0 lbs. at 5.6c	2,063.66	
Structural steel, 103,683.0 lbs. at 8c	8,294.64	
Concrete handrail, 84.0 lin. ft. at $5.00	420.00	
Lumber and timber, 1.96 M-FBM at $45.00	88.20	
Trestle superstructure, 40.0 lin. ft. at $16.50	660.00	
Piling cut-offs, 746.1 lin. ft. at 19.4c	144.74	
Cement adjustment, 30.75 bbls. at $3.51	107.93	
Material taken over by the state	95.63	
Total amount earned by contractor	$20,755.86	
Deduction to cover unfinished work	60.00	
Total amount paid to contractor		20,695.86
Grand total cost of project		$22,622.04

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$13,623.18	$.....	$.....	$13,623.18
Expended 1927-28 biennium	Cr. 5,599.65	8,000.00	6,598.51	8,998.86
Total expended to date	$ 8,023.53	$ 8,000.00	$ 6,598.51	$22,622.04
Estimated balances to complete	Cr. 6,051.09	.....	6,051.09	.....
Estimated total costs	$ 1,972.44	$ 8,000.00	$12,649.60	$22,622.04

Garibaldi-Hobsonville Grading

Federal Aid Project No. 129-C

On the Roosevelt Coast Highway, from Mile Post 65.81, at Sta. 535+50, which station is in the town of Garibaldi, south to Mile Post 69.04, at Sta. 365+00, which station is approximately one and eight-tenths of a mile north of Bay City; 3.23 miles of grading, 32-foot standard roadbed.

Contract No. 892, awarded June 24, 1926, to A. Guthrie and Company, of Portland, Oregon. Work commenced July 12, 1926; completed June 22, 1927. Final cost, $98,661.56. Resident Engineer, G. S. Gray.

[TILLAMOOK]

The special features of location of the Garibaldi-Hobsonville section have been particularly noted in the last biennial report. There were no features of construction out of the ordinary other than the moving of the Southern Pacific railroad track along the bluff section south of the Miami River, in a very similar way and to a comparable extent as upon the Brighton-Jetty Creek section a couple of years earlier and upon the Wheeler-Brighton section a little later. Construction work was completed without special incident and the road was ready for surfacing in June, 1927.

Further details will be found on page 400 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 3,760.37
Moving S. P. R. R. Co. track and appurtenances		144.51
Constructing drainage ditches and culverts		2,419.93
Placing riprap		56.71
Constructing guard fence		1,141.11
Removing slides and cleaning ditches		7,839.36
Maintenance of completed portion of road		52.30
Contract items as follows:		
Clearing and grubbing, all	$ 2,250.00	
Extra clearing and grubbing, 2.361 acres at $500.00	1,180.50	
Common excavation, 29,254.2 cu. yds. at 47c	13,749.47	
Intermediate excavation, 33,014.2 cu. yds. at 60c	19,808.52	
Solid rock excavation, 31,309.8 cu. yds. at 82c	25,674.04	
Overhaul, 134,951.0 yd. sta. at 3c	4,048.53	
Truck haul, 13,466.0 yd. mi. at 25c	3,366.50	
Class "A" concrete, 19.94 cu. yds. at $33.00	658.02	
Class "C" concrete, 7.03 cu. yds. at $30.00	210.90	
Metal reinforcement, 2,508 lbs. at 8c	200.64	
12-inch concrete pipe, 659 lin. ft. at $1.50	988.50	
18-inch concrete pipe, 55 lin. ft. at $3.00	165.00	
24-inch concrete pipe, 70 lin. ft. at $4.00	280.00	
30-inch concrete pipe, 93 lin. ft. at $5.50	511.50	
36-inch concrete pipe, 48 lin. ft. at $6.50	312.00	
Bar run gravel, 1,986.7 cu. yds. at $2.00	3,973.40	
Riprap, 609.1 cu. yds. at $1.15	700.47	
Pipe backfill, 380.7 cu. yds. at 50c	190.35	
Rock borrow, 4,147.9 cu. yds. at 65c	2,696.14	
Force account items:		
Furnishing and hand placing rock on outside railroad fill	764.35	
Ditching, placing drain tile and rocking around slides	324.13	
Constructing drainage structures not covered by contract	576.20	
Special maintenance of road over project	490.60	
Moving and replacing private water system	32.42	
Repairing old bridge and removing same after completion of new bridge	25.23	
Moving shovel by rail from north to south side of Miami River	69.86	
Total amount paid to contractor		83,247.27
Grand total cost of project		$98,661.56

PARTICIPATION IN COST

	State	*County*	*Government*	*S. P. Co.*	*Total*
Expended 1925-26 biennium	$23,389.16	$	$	$	$23,389.16
Expended 1927-28 biennium	Cr. 8,727.60	34,000.00	50,000.00		75,272.40
Total expended to date	$14,661.56	$34,000.00	$50,000.00	$	$98,661.56
Estimated balances to complete	Cr. 8,960.46		Cr. 1,039.54	10,000.00	
Estimated total costs	$ 5,701.10	$34,000.00	$48,960.46	$10,000.00	$98,661.56

[TILLAMOOK]

Rockaway-Garibaldi Grading

Federal Aid Project No. 129-F

On the Roosevelt Coast Highway, from Mile Post 61.45, at Sta. 765+60, which station is approximately one-half mile south of the Rockaway postoffice, south to Mile Post 65.81 at Sta. 535+50, which station is approximately one-half mile north of the Garibaldi postoffice; 4.36 miles of grading, 32-foot standard roadbed.

Contract No. 965, awarded March 29, 1927, to Guy F. Atkinson, of Portland, Oregon. Work commenced April 12, 1927; completed June 22, 1928. Estimated cost, $230,000, consisting of $78,616.22 from state funds, $70,000 from county funds and $81,383.78 from government funds. Expenditures to date, $207,981.31, consisting of $139,199.37 from state funds and $68,781.94 from government funds. Resident Engineers, until April, 1928, A. J. Olsen; after April, 1928, B. O. Johnson.

The last section of the Roosevelt Coast Highway north of Newport to be put under contract for grading was the 4.36 miles between Rockaway and Garibaldi, which was undertaken early in 1927.

At the time this contract was begun a similar contract covering the Wheeler-Brighton section was already under way and in connection with both of these contracts it was necessary to close the road for a short period during regrading of sections where the old road and the new road were coincident as to location, but not as to grade. In order that the road on both contracts should not be closed at the same time and thus cut off access to the Rockaway beach territory, it was specified that no work should be done on the Rockaway-Garibaldi section which would necessitate closing the road or disturb the traveled roadway of the then used road during the summer beach season or until September 10, 1927, by which date it was anticipated the contract between Wheeler and Brighton would be completed at least in so far as the portion to be closed during construction was concerned. As events developed, however, the work at Brighton was not in shape to carry traffic until September 20, so that it was necessary to forbid closing of the Barview-Garibaldi section until that latter date, or for a period of 10 days later than the time which had been provided in the original schedule of performance mentioned in the contract. Upon this modification of that schedule the contractor has based a large claim for extras and damages which, at the date of this report, is pending before the Highway Commission and has prevented the final settlement with the contractor.

The one special feature of the project was the large slide which occurred October 20, 1927, at a point about half a mile south of Barview. This slide eventually brought down approximately 47,000 cubic yards of material from an area 183 feet in width along its front on the highway and extending back a distance up the hillside 395 feet horizontally and to a height of 353 feet above the roadbed. The first fall of the slide covered not only the highway roadbed which was practically all excavated at that place but also the Southern Pacific railroad track, which was immediately adjacent. Railroad traffic was interrupted for a period of about 41 hours.

There were several other smaller slides during progress of the work due to the very unusual formation of the terrain over which the highway runs, in the matter of distinct cleavage planes in the rock along the rock sections in the vicinity of the Coast Guard station at Barview and at

Smith's Point. These planes lie on a dip of about the angle of repose of ordinary materials and on a strike closely parallel with the highway, which circumstances make slides almost a certainty when it is necessary in construction work of this character to cut away the lower portions of the strata formed by these planes. These slides, the smaller ones varying in size from a few hundred to several thousand yards, with the large slide mentioned above, were responsible for a considerable over-run in the contract above the preliminary estimate.

At the date of this report the contract work has been entirely completed, though final settlement has not been made because of the unsettled claims being made by the contractor.

Mohler Bridge

Federal Aid Project No. 129-B

On the Roosevelt Coast Highway, over south fork of Nehalem River near Mohler; two 100-foot steel spans and two 50-foot concrete spans.

Contract No. 889, awarded March 25, 1926, to Portland Bridge Company, of Portland, Oregon. Work commenced June 21, 1926; completed May 30, 1927. Final cost, $51,947.13. Resident Engineer, R. W. Archibald.

This bridge replaces a combination truss at the same site. It gives access to the newly completed section of highway between Mohler and Garibaldi via the Tillamook beaches.

Further details will be found on page 404 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 2,769.77
Labor and materials furnished by the state:		
Crushed rock obtained from adjacent project		753.75
Painting and refinishing concrete		229.66
Name plates for bridge		35.40
Equipment furnished and deducted from contractor's estimates		129.88
Contract items as follows:		
Excavation, 626.4 cu. yds. at $6.50	$ 4,071.60	
Wood piling, 1,658.5 lin. ft. at 50c	829.25	
Piling cut-off, 968.2 lin. ft. at 19c	183.96	
Class "A" concrete, 153.03 cu. yds. at $25.00	3,825.75	
Class "B" concrete, 398.3 cu. yds. at $25.00	9,957.50	
Class "D" concrete, 213.25 cu. yds. at $25.00	5,331.25	
Metal reinforcement, 103,843.0 lbs. at 5c	5,192.15	
Structural steel, 207,945.0 lbs. at 8½c	17,675.33	
Concrete handrail, 237.5 lin. ft. at $4.00	950.00	
Cement adjustment, 19.0 bbls. at $3.37	64.03	
Force account items:		
Repairing old bridge and extra expense on new	227.73	
Total amount earned by contractor	$48,308.55	
Deductions:		
Rental of equipment furnished by state	129.88	
Agreed amount for completing by state	150.00	
Total amount paid to contractor		48,028.67
Grand total cost of structure		$51,947.13

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1925-26 biennium	$12,707.07	$10,000.00	$	$22,707.07
Expended 1927-28 biennium	Cr. 3,810.14	7,000.00	26,505.20	29,240.06
Total of expenditures	$ 8,896.93	$17,000.00	$26,050.20	$51,947.13

[TILLAMOOK]

Christianson Slough Culvert

On the Roosevelt Coast Highway, near Tillamook; 12-foot concrete slab span.

Contract No. 988, awarded July 28, 1927, to O. M. Olds, of Oak Grove. Work commenced August 15, 1927; completed October 15, 1927. Final cost, $5,211.70. Resident Engineer, C. A. Jordan.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 446.00
Purchase of right-of-way for channel change		355.00
Temporary bridge constructed by state forces		321.46
Surfacing gap in macadam at bridge approaches		32.30
Riprapping work done by state forces		687.52
Contract items as follows:		
Excavation for bridge footings, 343.5 cu. yds. at $2.20	$ 755.70	
Excavation for channel change, 1,156.1 cu. yds. at 50c	578.05	
Breaking down existing culvert, all	200.00	
Removing 36-inch concrete pipe culvert, 100 lin. ft. at 50c	50.00	
Class "A" concrete, 75.01 cu. yds. at $19.00	1,425.19	
Metal reinforcement, 6,508.0 lbs. at 6c	390.48	
Total amount earned by contractor	$3,399.42	
Deduction for completion work by state	30.00	
Total amount paid to contractor		3,369.42
Grand total cost of project, all state funds, 1927-28		$5,211.70

Mohler Trestle

On the Roosevelt Coast Highway, near Mohler; seven 19-foot trestle spans.

Final cost, $1,039.41. Resident Engineer, E. G. Ricketts.

During the high water of the fall of 1927 a short section of grade between Mohler and the Nehalem River bridge was washed out. To guard against further trouble, an overflow trestle was built across the washout. This work was done by state forces under the direction of E. G. Ricketts.

This work was done as a part of the Mohler-Wheeler grading project and the cost of the trestle is included in the cost statement for that work.

Maintenance

Because of the fact that practically all of the state highway system in Tillamook County is of macadam construction, there being only an aggregate of about 15 miles of pavement in the county, a large part of the maintenance operations are devoted to oiling and the maintenance of oiled macadams. The work done on the various sections and under various specifications, in the way of oiling and the construction of bituminous macadam surfaces, is described in detail in the section of this report dealing with general maintenance operations of the state, and it need only be recorded here that the status of the oiling program in the county at the close of 1928 is as follows:

From the Clatsop County line to Brighton on the Roosevelt Coast Highway no oiling work has yet been done. Rock supplies for the future oiling of the section as far as Mohler have been secured under a contract in connection with furnishing of similar materials in Clatsop County

during 1927 and for the section south of Mohler similar supplies are being furnished in connection with the contract for the original macadam surfacing of that section.

From Brighton to Rockaway the old macadam was given a treatment of light oil for prevention of dust and conservation of surfacing in 1927, but owing to the construction work being carried on over and in the vicinity of that section in 1928, no further oiling treatment has been given to it and to all intents and purposes it is an unoiled section.

The recently constructed macadam from Rockaway to Garibaldi is also unoiled.

From Garibaldi to Hobsonville a heavy oil-surface treatment, using No. 2 Gasco road binder, was applied in 1928 and from Hobsonville to Wilson River the 95 per cent oil-surface treatment given in 1927 has been continued with only an intermittent reoiling of weaker spots in 1928.

The Moore Cut-off section has suffered very severely from the exceedingly heavy log hauling traffic to which it has been subjected and it has been found impracticable to maintain the oiled surfacing in anything like satisfactory condition. The effort, however, to do so is being continued but with the expectation that the section will be reconstructed in 1929.

From Beaver to the Big Nestucca River the road was given a heavy oil-surface treatment in 1927, using Gasco road binder and a similar treatment using 95 per cent asphaltic oil in 1928.

From the Big Nestucca River to Hebo a heavy type bituminous macadam surface using 95 per cent asphaltic oil has been constructed in 1928.

From Hebo to Cloverdale the 85 per cent asphaltic oil-surface treatment laid in 1926 has been continued with only a thorough patching. This section has given wonderful service, considering its type and has been one of those sections which has given confidence to the department in continuing and extending its oiling program in the coast country.

From Cloverdale to Neskowin in 1928 the road has been given an intermittent surfacing of various types of oiled treatment. The section came through the winter of 1927-1928 showing some sections on which the light oil treatment of 1927 remained in fine condition, while on other sections it had very largely deteriorated until its status as an oiled road had almost entirely disappeared. These latter sections in 1928 were patched with penetration type bituminous surface and the entire road, both patched and unpatched sections, was given a surface treatment using 95 per cent asphaltic oil.

On the McMinnville-Tillamook Highway from Hebo to Yamhill County line a surface treatment of 95 per cent asphaltic oil has been applied, followed by the patching and smoothing up of the road in a few spots and particularly on some of the sharper curves with a blade mix bituminous macadam.

Other than the work in connection with the oiling and maintenance of oiled sections no material expenditure has been made beyond the ordinary maintenance of drainage and roadbed.

Maintenance operations in Tillamook County have been under the field direction of G. S. Gray, Resident Engineer, with headquarters at Tillamook. General supervision of the work has been handled by W. D. Clarke, Division Engineer, with headquarters at Salem.

[TILLAMOOK]

Neskowin-Hebo-Grande Ronde Maintenance Materials

On the Roosevelt Coast Highway, from Mile Post 108.0, approximately three miles north of Neskowin, to Mile Post 86.0, approximately four miles north of Hemlock, and on the McMinnville-Tillamook Highway from Mile Post 0.00 at Hebo, east to Mile Post 17.0, approximately one and two-tenths of a mile east of Bee Ranch; the furnishing of 30,340 cubic yards of maintenance materials.

Contract No. 952, awarded March 3, 1927, to R. W. Stevenson, of Mt. Vernon, Washington. Work commenced July 26, 1927; completed November 15, 1928. Estimated cost, $60,000 from state funds. Expenditures to date, $49,719.70. Resident Engineer, G. S. Gray.

Among the many contracts let in 1927 for furnishing crushed-rock materials for maintenance and oiling operations, was one covering the Hebo-Neskowin section of the Roosevelt Highway and Hebo-Grand Ronde section of the McMinnville-Tillamook Highway. Bids for this work were taken upon specifications which permitted several options to the bidder as to the point or points from which rock might be furnished, the successful bidder electing to secure it from a ledge known as the Bell Mountain quarry south of Three Rivers opposite the mouth of Cedar Creek about one mile east of Hebo. This site, even before development, presented some unusual problems in that it was sitting high up on the side of the mountain above the highway and required the construction of a bridge over Three Rivers and some special means of transporting the rock from the quarry to the highway. The contractor elected to do this by a truck road which necessitated very heavy grade. During development of the quarry which had, apparently, an unlimited supply of talus, it was found that beneath the surface the talus rock was so mingled with a tenacious clay as to make it unsuitable for oiling rock due to the impracticability of getting it clean. It became necessary later to shoot the original ledge above the talus slope in order to get satisfactory rock.

Because of these difficulties and inefficient handling of the operations the original contractor fell down on the job and the work was taken over by the bondsmen. It was later relet by the bonding company to Lindstrom & Feigenson, Portland, Oregon, and is being finished by that contractor. The work is not complete at the close of the biennium.

Farmer Creek Gravel Pit Crushed Gravel

On the Roosevelt Coast Highway, at Mile Post 96.03, at the Farmer Creek gravel pit, located in the Big Nestucca River near the outlet of Farmer Creek, approximately two miles north of Hebo; maintenance materials.

Contract No. 893, awarded June 24, 1926, to Stevens and Doty, of Redmond, Oregon. Work commenced August 9, 1926; completed September 15, 1927. Final cost, $19,204.78. Resident Engineers, J. C. Russell and G. S. Gray.

This contract, which originally called for 7,600 cubic yards of crushed gravel maintenance material, was enlarged before its completion in 1927 so that a total of 12,020 cubic yards were furnished. The additional material was required for maintaining sections within the zone to which

[TILLAMOOK]

the Farmer bar is tributary—the Moore Cut-off and the northerly part of the Dolph-Hebo section—as well as the Beaver-Hebo section upon which the Farmer bar is immediately located, which sections were demanding larger quantities of gravel to keep them in shape than had been anticipated, by reason of the scarifying and reshaping that had been done in 1926.

Further details will be found on page 406-407 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 426.21
Purchase of Farmer gravel pit		718.20
Hauling materials with state trucks		1,165.84
Engineering expense charged to contractor account over-run of time limit		490.84
Contract items as follows:		
Grade "A" crushed gravel in trucks, 350.5 cu. yds. at $1.50	$ 525.75	
Grade "B" crushed gravel in trucks, 393.5 cu. yds. at $1.48	582.38	
Grade "D" crushed gravel in trucks, 7,387.0 cu. yds. at $1.40	10,341.80	
Grade "E" crushed gravel in trucks, 3,889.0 cu. yds. at $1.40	5,444.60	
Total amount earned by contractor	$16,894.53	
Deduction account of over-run of time limit	490.84	
Total amount paid to contractor		16,403.69
Grand total cost of project, all state funds		$19,204.78

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 4,515.33
Expended 1927-28 biennium	14,689.45
Total of expenditures	$19,204.78

Extra Right of Way at Hebo

On the Roosevelt Coast Highway at Hebo.

At the junction of the McMinnville-Tillamook Highway with the Roosevelt Coast Highway at Hebo an improvement in the situation was made by acquiring, through negotiation with the property owner additional right of way at the northwesternly corner of the intersection so that the highway roadbed could be widened at that point and so made more satisfactory and safe. This improvement was made at the particular time that it was, because of the construction of a filling station there and the desirability of having it located so as to avoid its constituting a hazard by cutting off the view at the corner.

Boyer-Dolph Survey

In connection with the construction of the Salmon River Road by the Salmon River and Grande Ronde Improvement District and the federal government through the Forest Service, and in view of the fact that the McMinnville-Tillamook Highway between the junction of the Salmon River road at Valley Junction and Dolph is rapidly becoming inadequate to properly handle the increased volume of traffic imposed upon it, has arisen the question of the advisability of constructing a connecting link from the McMinnville-Tillamook Highway at Dolph to the Salmon River Road at Boyer. This connecting road, following, as it would, up the Little Nestucca River on easy grade and excellent alignment would, upon completion of the Salmon River Road, obviate the necessity for maintaining a closely paralleling road along the present route of the McMinnville-

[TILLAMOOK]

Tillamook Highway for nothing except local traffic and would save the cost of the reconstruction of the Valley Junction-Dolph section of the present highway, which will otherwise be necessary in the not distant future. With this situation in mind a survey has been made of the Boyer-Dolph route. This survey began at a point on the Salmon River road practically at its intersection with the county line between Polk and Tillamook Counties and followed directly down the Little Nestucca River to Dolph, a distance of 5.59 miles. The survey was begun in September, 1927, and completed in February, 1928, having been carried on at spare times when the engineer and his party could be released from other work. This survey was made by F. D. Eason, Resident Engineer, with headquarters at McMinnville, Oregon.

Mohler-Hobsonville Survey

On page 410 of the report for 1925-1926, are noted the particulars relating to the Mohler-Hobsonville survey and no additional work has been done upon that project as distinguished from construction engineering during the last two years. Expenditures charged against the work have been for delayed charges incurred in the previous biennium.

Tillamook-Forest Grove Survey

Survey of the so-called Wilson River route between Forest Grove and Tillamook was undertaken by the State Highway Commission in connection with the proposed construction of a toll road upon that route and was begun in November, 1925, and is noted on pages 410-411 of the 1925-1926 biennial report. This survey, which was practically completed at the close of that biennium, was finished early in 1927, since which time the question of a toll road has been decided unfavorable to its construction.

UMATILLA COUNTY

Within the boundaries of what is now Umatilla County some of the earliest settlements in Eastern Oregon were established. The town of Umatilla on the Columbia River in the northwest corner of the county was an important freight, stage and river terminal for the interior in the early mining days. The county is now one of the large wheat producing sections of the northwest and has considerable acreage under irrigation producing diversified crops.

The state highway system in this county consists of the Old Oregon Trail, the Oregon-Washington Highway, the Pendleton-Cold Springs Highway, the Pendleton-John Day Highway and the Wallula Cut-off. The total mileage within the county is approximately 246.0 miles; 77.25 miles being on the Old Oregon Trail; 69.23 miles on the Oregon-Washington Highway; 30.35 miles on the Pendleton-Cold Springs Highway; approximately 48.0 miles on the Pendleton-John Day Highway; and approximately 20.0 miles on the Wallula Cut-off.

The Old Oregon Trail and the Pendleton-Cold Springs Highways were completed previous to this biennium. The Oregon-Washington Highway was completed and the greater portion of the Pendleton-John Day Highway is now graded or surfaced. No work has been undertaken on the Wallula Cut-off. During this biennium four miles were surfaced on the Oregon-Washington Highway and 12.25 miles were graded on the Pendleton-John Day Highway.

During the 1925-1926 biennium the State Highway Commission authorized the acquisition of a tract of land adjacent to the Old Oregon Trail in Umatilla County in order that the timber thereon might be preserved. During this biennium considerable progress has been made in securing a strip of land varying from 500 feet to 1,000 feet in width, and within a short time this work should be completed.

All work in this county is under the direction of H. G. Smith, Division Engineer, headquarters at La Grande.

Meacham Overcrossing

Federal Aid Project No. 62-B

On the Old Oregon Trail Highway, at Meacham; 325 feet of concrete viaduct over the tracks of the Oregon-Washington Railroad & Navigation Company and Meacham Creek.

Contract No. 814, awarded May 28, 1925, to J. D. Tobin, of Portland, Oregon. Work commenced June 18, 1925; completed December 20, 1925. Final cost, $35,186.36. Resident Engineer, M. Stephenson.

This project has been opened during the present biennium only to record the receipt of $12,381.98 from the Oregon-Washington Railroad & Navigation Company and $2,487.63 from the government in final cooperation by both parties. The final cost now consists of $2,522.58 from state funds, $20,281.80 from government funds and $12,381.98 from Oregon-Washington Railroad & Navigation Company funds.

Further details will be found on page 418 of the 1925-26 report.

[UMATILLA]

Meacham Overcrossing Surfacing

On the Old Oregon Trail Highway, from Sta. 1590+00 in the town of Meacham, east to Sta. 1632+50, approximately six-tenths of a mile east of the town of Meacham; 0.66 mile of surfacing, 18-foot width, trenched.

Contract No. 868, awarded February 25, 1926, to H. G. Johnson, of Dayton, Washington. Work commenced May 1, 1926; completed July 15, 1926. Final cost, $8,646.08. Resident Engineer, Oscar Cutler.

The surfacing of this section upon the grade constructed under a separate contract, together with an overhead bridge, eliminated a dangerous railroad crossing in the town of Meacham.

Further details will be found on page 413 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 724.66
Labor and materials furnished by state:		
Blading and processing surfacing materials		409.45
Purchase of quarry site		480.90
Installing tile drains, Sta. 1612 to 1617		146.49
Cost of maintenance materials transferred to maintenance account		Cr. 7,000.00
Items deducted from the contractor's estimate:		
Rental of state-owned equipment		42.22
Blading work performed by state forces		361.44
Contract items as follows:		
Sub-base surfacing, 169.5 cu. yds. at $1.95	$ 330.53	
Base course surfacing, 1,051.5 cu. yds. at $1.95	2,050.43	
Top course surfacing, 828.5 cu. yds. at $1.95	1,615.58	
Grade "A" maintenance materials, 2,000.0 cu. yds. at $1.80	3,600.00	
Grade "B" maintenance materials, 1,035.1 cu. yds. at $1.90	1,966.69	
Additional maintenance materials, 1,148.7 cu. yds. at $1.50	1,723.05	
Filler from Kamela pit, 467.0 cu. yds. at $2.75	1,284.25	
Common filler, 690.0 cu. yds. at 50c	345.00	
Filler haul, 1,378.5 yd. mi. at 20c	275.70	
Earth cushion, 995.5 cu. yds. at 50c	497.75	
Cushion haul, 524.0 yd. mi. at 20c	104.80	
Stripping overburden, 90.6 cu. yds. at 25c	22.65	
Force account items:		
Removing stumps from filler pit	14.08	
Cleaning slides from ditches	54.07	
Total amount earned by contractor	$13,884.58	
Deductions:		
Rental of state-owned equipment	42.22	
Blading work performed by state forces	361.44	
Total amount paid to contractor		13,480.92
Grand total cost of project		$ 8,646.08

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$8,422.86
Expended 1927-28 biennium	223.22
Total of expenditures	$8,646.08

Jones Hill-Vinson, East Unit Surfacing

On the Oregon-Washington Highway, from the Morrow-Umatilla County line to Vinson on Big Butter Creek; four miles of surfacing.

Contract No. 931, awarded October 26, 1926, to Albert L. Smith, of Heppner, Oregon. Work commenced March 10, 1927; completed January 20, 1928. Estimated cost, $17,000, from state funds. Resident Engineers, E. B. Loken, C. E. Carter and W. W. Stiffler.

This work completed the Oregon-Washington Highway in Umatilla County and with the section to the west in Morrow County completed the Oregon-Washington Highway throughout its entire length.

Further details will be found on page 414 of the 1925-26 report.

[UMATILLA]

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,299.68
Lease of quarry site		100.00
Sprinkling surfacing materials		650.29
Credit for 4 cu. yds. rock sold to outside party		Cr. 10.00
Contract items as follows:		
Base course surfacing, 3,220.0 cu. yds. at $1.58	$ 5,087.60	
Top course surfacing, 3,438.0 cu. yds. at $1.58	5,432.04	
Grade "A" maintenance materials, 394.14 cu. yds. at $1.58	622.74	
Grade "B" maintenance materials, 1,234.1 cu. yds. at $1.40	1,727.74	
Stripping filler pits, 916.3 cu. yds. at 25c	229.08	
Earth filler, 3,096.0 cu. yds. at 25c	774.00	
Filler haul, 4,466 yd. mi. at 20c	893.20	
Force account item:		
Picking rock from earth filler	19.16	
Total amount earned by contractor	$14,785.56	
Less final estimate in process of payment	425.18	
Total amount paid to contractor		14,360.38
Grand total expended, all state funds, 1927-28		$16,400.35

Umatilla River Bridge

Federal Aid Project No. 112

On the Columbia River Highway, near Umatilla; four 110-foot concrete arch spans and 96 feet of concrete viaduct approach.

Contract No. 757, awarded September 25, 1924, to Lindstrom & Feigenson, of Portland, Oregon. Work commenced October 13, 1924; completed March 19, 1925. Final cost, $52,924.72.

Further details will be found on page 418 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 3,268.89
Bronze name plates		90.39
One gallon cement paint and one day labor		8.80
Contract items as follows:		
Excavation to plan elevation, 100.40 cu. yds. at $4.00	$ 401.60	
Excavation below elevation, 122.65 cu. yds. at $4.00	490.60	
Class "A" concrete, 836.68 cu. yds. at $26.00	21,753.68	
Class "B" concrete, 134.42 cu. yds. at $26.00	2,822.82	
Class "D" concrete, 319.83 cu. yds. at $26.00	8,315.58	
Metal reinforcement, 198,629.0 lbs. at 5½c	10,924.60	
Concrete handrail, 875.0 lin. ft. at $4.50	3,937.50	
Cement adjustment, 103.0 bbls. at $3.99	410.97	
Force account items:		
Furnishing magnesite stucco finish in place of Portland cement stucco finish	170.00	
Water stops in expansion joints and extra joints in handrail	356.80	
Placing electric light conduit in curb	93.38	
Total amount earned by contractor	$49,677.53	
Deduction for standard finish instead of painting	50.00	
Total amount paid to contractor		49,627.53
Grand total cost of structure		$52,995.61

PARTICIPATION IN COST

	State	*County*	*Government*	*Total*
Expended 1923-24 biennium	$ 9,890.07	$	$	$ 9,890.07
Expended 1925-26 biennium	Cr. 10,427.84	19,862.33	33,600.16	43,034.65
Expended 1927-28 biennium	70.89			70.89
Total of expenditures	Cr.$ 466.88	$19,862.33	$33,600.16	$52,995.61

[UMATILLA]

Emigrant Hill Grading and Widening Roadbed

Federal Aid Project No. 118

On the Old Oregon Trail Highway, from a point approximately six and seven-tenths miles east of the city limits of Pendleton to Dead Man's Pass, in the Blue Mountains; 12.58 miles of roadbed widening.

Contract No. 783, awarded March 26, 1925, to Swartley Brothers, of Corvallis, Oregon. Work commenced April 10, 1925; completed December 15, 1925. Final cost, $107,868.37. Resident Engineer, C. E. Carter.

This project has been opened during the present biennium only to record the receipt of $84,791.52 as the cooperative share of the federal government. This leaves a total of $23,076.85 as having been expended from state funds.

Further details will be found on page 415 of the 1925-26 report..

South Unit, Lazinka Ranch-Albee Grading

On the Pendleton-John Day Highway, from the south end of the North Unit of the Lazinka Ranch-Albee section to the north end of the Albee-Ukiah section near Albee; six miles of grading.

Contract No. 1,019, awarded November 29, 1927, to Rhodes & Dillard, of Medford, Oregon. Work commenced February 24, 1928. Estimated cost, $82,000. Resident Engineer, W. W. Stiffler.

The grading of this section will complete a standard roadbed on the Pendleton-John Day Highway from Nye on the Oregon-Washington Highway west of Pilot Rock, to or near Ukiah. Funds for the work were provided by Umatilla County, with the state paying for the engineering.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 4,929.15
Contract items as follows:		
Clearing and grubbing, all	$10,000.00	
Common excavation, 26,137.3 cu. yds. at 55c	14,375.52	
Intermediate excavation, 17,516.5 cu. yds. at 55c	9,634.08	
Solid rock excavation, 49,967.1 cu. yds. at 55c	27,481.91	
Overhaul, 78,553.0 yd. sta. at 3c	2,356.59	
Earth cushion, 6,090.0 cu. yds. at 60c	3,654.00	
Earth cushion haul, 3,270.5 yd. mi. at 20c	654.10	
Dry rubble, 91.913 cu. yds. at $8.00	735.30	
Class "A" concrete, 69.68 cu yds. at $35.00	2,438.80	
Class "C" concrete, 1.84 cu. yds. at $24.00	44.16	
Metal reinforcement, 8,149.0 lbs. at 8c	651.92	
12-inch corrugated galvanized iron pipe, 358.0 lin. ft. at $1.75	626.50	
18-inch corrugated galvanized iron pipe, 694.0 lin. ft. at $2.60	1,804.40	
24-inch corrugated galvanized iron pipe, 138.0 lin. ft. at $3.50	483.00	
18-inch concrete pipe, 258.0 lin. ft. at $3.25	838.50	
24-inch concrete pipe, 78.0 lin. ft. at $5.00	390.00	
36-inch concrete pipe, 436.0 lin. ft. at $8.00	3,488.00	
Lumber and timber, 1.734 M-FBM at $40.00	69.36	
Total amount earned by contractor	$79,726.14	
Less retained percentage	8,565.70	
Total amount paid to contractor		71,160.44
Grand total expended, 1927-28		$76,089.59

PARTICIPATION IN COST

	State	*County*	*Total*
Expended to date	$4,929.15	$71,160.44	$76,089.59
Estimated cost to complete	70.85	5,839.56	5,910.41
Total estimated costs	$5,000.00	$77,000.00	$82,000.00

Maintenance

At the close of the 1927-1928 biennium 183.52 miles are under maintenance by state forces in Umatilla County; 77.25 miles on the Old Oregon Trail, 62.25 miles being surface-treated oil macadam and 15 miles of untreated macadam. On the Oregon-Washington Highway 36.64 miles of asphaltic concrete; 13.90 miles of oil-surface-treated macadam and 18.69 miles of untreated macadam; on the Pendleton-John Day Highway 6.69 miles of untreated macadam, and on the Pendleton-Cold Springs Highway 30.35 miles of untreated macadam.

During this biennium there has been crushed for maintenance purposes in Umatilla County 129,677.4 cubic yards of rock or gravel.

During the spring of 1928 the Old Oregon Trail from Mile Post 253.0 to 268 in the Blue Mountains failed due to unusually severe frost action and the wearing out of the surface placed in 1923. Approximately 30,000 cubic yards of heavy sub-surface has been placed during the summer of 1928, and state maintenance forces have been reconstructing the drainage and widening the roadbed. The Old Oregon Trail was reoiled in 1927 from Mile Post 186.88 to Mile Post 267.17 and in 1928 from Mile Post 186.88 to Mile Post 245.2. During 1927 the macadam on the Oregon-Washington Highway from Pilot Rock to Pendleton was oiled and the small section oiled in 1926 was reoiled. Two or three miles of experimental penetration oiling was placed near Pendleton in 1927.

The asphaltic concrete pavement on the Oregon-Washington Highway from Pendleton to the Washington state line had become rough and uneven in many places, necessitating considerable surface burning and patching which was done in the fall of 1927 and spring of 1928. Some ditch work was done between Hermiston and Umatilla by extra gang forces where the highway was continually softened by seepage water from irrigation ditches.

Extra gang foremen in charge of special work were F. W. Churchill, D. B. Cooper, Frank Hurt, Joe Garney, Wm. Wilkinson, Harrison Davis and J. H. Campbell.

The patrol sections and patrolmen in charge were from Morrow County line to Umatilla on the Old Oregon Trail, E. T. Messenger, with headquarters at Boardman. From Umatilla to Pendleton, on the Old Oregon Trail, Claude Stamper, with headquarters at Echo. From Pendleton to Mile Post 243.0 on the Old Oregon Trail, Pendleton to McKay Creek on the Oregon-Washington Highway, and Pendleton to Cold Springs on the Pendleton-Cold Springs Highway, F. W. Churchill and F. E. Barnes, successively, with headquarters at Pendleton. From the Morrow County line to McKay Creek on the Oregon-Washington Highway and from Nye to Lazinka Ranch on the Pendleton-John Day Highway, Rupert C. Walker and Alfred M. Westgate, successively, with headquarters at Pilot Rock. From Pendleton to the Washington state line on the Oregon-Washington Highway, Truman Messenger, with headquarters at Athena. From Mile Post 243.0 to the Union County line on the Old Oregon Trail, Helmer Olsen, with headquarters at Meacham.

C. E. Carter was Resident Maintenance Engineer for this county, with headquarters at Pendleton, except the Old Oregon Trail from Mile Post 243.0 to the Union County line, which has been under the direction of Oscar Cutler, Division Office Engineer, with headquarters at La Grande. H. G. Smith, Division Engineer, is in general charge of maintenance in Division No. 5. R. H. Baldock is State Maintenance Engineer.

[UMATILLA]

Umatilla-Nolin Resurfacing

On the Old Oregon Trail Highway, from Umatilla to Nolin; 22.7 miles of resurfacing, using broken stone.

Contract No. 706, awarded January 8, 1924, to Bauers & Bauers, of Dayton, Washington. Work commenced February 25, 1924; completed October 18, 1924. Final cost, $119,047.93. Resident Engineer, C. E. Carter.

Further details will be found on page 422 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 6,533.92
Labor and materials furnished by the state:		
Constructing maintenance traps at Hermiston and Echo		1,135.11
Widening roadbed and building up super elevations		2,667.67
Purchase of quarry sites and filler pits		566.50
Lengthening culverts		496.60
Warning signs for protection of traveling public		57.39
Installing screen at filler pit		50.99
Prospecting for surfacing materials		217.92
Sprinkling surfacing materials		7,071.69
Audit of contractor's books account of fraudulent issuance of rock tickets by rock checker		469.77
Rental of state equipment deducted from contractor's estimate		178.00
Contract items as follows:		
Broken stone surfacing, top, 28,212.5 cu. yds. at $2.65	$74,763.13	
Broken stone surfacing, base, 828.0 cu. yds. at $2.60	2,194.20	
Maintenance materials, 2,459.4 cu. yds. at $2.60	6,394.44	
Earth filler, 12,204.0 cu. yds. at 75c	9,153.00	
Earth filler, screened, 4,679.5 cu. yds. at $1.25	5,849.37	
Oversize material for riprap, 396.0 cu. yds. at 50c	198.00	
Force account items:		
Excavating site for piling maintenance materials	67.61	
Blading and maintaining accepted portion of road	730.26	
Extra haul on filler materials from Stanfield pit	390.36	
Reimbursing contractor for rental of camp site	40.00	
Total amount earned by contractor	$99,780.37	
Deduction for rental of state equipment	178.00	
Total amount paid to contractor		99,602.37
Grand total cost of project, all state funds		$119,047.93

SEGREGATION OF FUNDS

Expended 1923-24 biennium	$109,091.19
Expended 1925-26 biennium	9,712.94
Expended 1927-28 biennium	243.80
Total	$119,047.93

Emigrant Hill Resurfacing

Federal Aid Project No. 118

On the Old Oregon Trail Highway, from a point approximately three miles east of Pendleton to Dead Man's Pass, in the Blue Mountains; 16.7 miles of resurfacing.

Contract No. 832, awarded June 26, 1925, to A. D. Kern, of Portland, Oregon. Work commenced August 26, 1925; completed May 12, 1926. Final cost, $68,977.63. Resident Engineer, C. E. Carter.

This project has been opened during the present biennium to record the receipt of $40,159.35 as the total cooperative share of the federal government, leaving a balance of $28,818.28 as having been expended from the state funds.

Further details will be found on page 420 of the 1925-26 report.

[UMATILLA]

East Unit, Pendleton-Kamela Maintenance Materials

On the Old Oregon Trail Highway, from Mile Post 256.0 three miles east of Dead Man's Pass to Mile Post 268.0 at Kamela; 12 miles of maintenance materials in trucks and stock piles.

Contract No. 1,001, awarded September 27, 1927, to Clyde R. Seitz, of La Grande, Oregon. Work commenced March 8, 1928. Estimated cost, $110,000, from state funds. Expenditures to date, $79,162.11. Resident Engineer, Oscar Cutler.

Crushed rock for maintenance purposes had become exhausted on this section, and the need for additional material having become imperative a contract was let for approximately 26,700 cubic yards in stock piles and trucks. The winter of 1927-1928 was unusually severe and the surfacing placed in 1923 failed practically throughout the entire distance of 12 miles. It was necessary that steps be taken to resurface the section, therefore a supplementary agreement to the contract was agreed to by the contractor and approximately 24,000 cubic yards of rock were placed on the grade.

The maintenance materials were increased from approximately 26,700 cubic yards to 46,500 cubic yards. State forces are also engaged in widening the roadbed and constructing drainage.

Pilot Rock-Freewater Maintenance Materials "A"

On the Oregon-Washington Highway, near Pilot Rock through Pendleton to the Oregon-Washington state line north of Freewater; 45 miles of maintenance materials in stock piles.

Contract No. 932, awarded October 26, 1926, to Pacific Construction Company, of Portland, Oregon. Work commenced February 10, 1927; completed June 22, 1927. Estimated cost, $17,000, from state funds. Resident Engineer, C. E. Carter.

The materials to be furnished under this contract were for use in oiling, oil maintenance and pavement shoulders. The contractor became financially embarrassed and was unable to complete the contract. The work remaining was readvertised and a new contract let.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 759.19
Labor and materials furnished by state:		
Purchase of quarry site		197.50
Preparing stock pile sites		66.69
Road oil to be deducted from contractor's estimate		329.00
Contract items as follows:		
Grade "A" broken stone, 2,247.2 cu. yds. at $1.25	$ 2,809.00	
Grade "B" broken stone, 6,100.0 cu. yds. at $1.25	7,626.13	
Grade "C" broken stone, 709.2 cu. yds. at $1.00	709.20	
Hauling broken stone, 25,389.3 yd. mi. at 19c	4,823.97	
Total amount earned by contractor	$15,968.30	
Deductions:		
Road oil furnished by state	329.00	
Final estimate in process of payment	2,631.30	
Total amount paid to contractor		13,008.00
Grand total expended on project, all state funds, 1927-28		$14,360.38

[UMATILLA]

Pilot Rock Maintenance Materials

On the Oregon-Washington Highway, from Nye, west of Pilot Rock, to a point near McKay Creek; 15 miles of maintenance materials in stock piles.

Contract No. 933, awarded October 26, 1926, to Harness & Colby, of Roseburg, Oregon. Work commenced January 10, 1927; completed June 1, 1927. Final cost, $8,861.91. Resident Engineer, C. E. Carter.

The materials furnished under this contract were for use in maintaining the macadam west of Pilot Rock and for oiling and oil maintenance east of Pilot Rock.

Further details will be found on page 421 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 384.70
Prospecting for surfacing materials		7.40
Preparing stock pile sites		9.77
Contract items as follows:		
Grade "A" broken stone, 1,202.4 cu. yds. at $1.55	$1,863.72	
Grade "B" broken stone, 3,278.0 cu. yds. at $1.17	3,835.26	
Hauling broken stone, 15,339.2 yd. mi. at 18c	2,761.06	
Total amount paid to contractor		8,460.04
Grand total cost of project, all state funds, 1927-28		$8,861.91

Arlington-Pendleton Maintenance Materials

On the Old Oregon Trail Highway, from Mile Post 150.0, five miles east of Arlington, to Mile Post 229.1 one and three-tenths of a mile west of Pendleton; 82.7 miles of maintenance materials in stock piles and trucks.

Contract No. 1,007, awarded October 25, 1927, to Joslin & McAllister, of Spokane, Washington. Work commenced January 1, 1928. Estimated cost, $116,000, from state funds. Expenditures to date, $106,124.85. Resident Engineer, C. E. Carter.

The maintenance materials on this section had become exhausted and in order to maintain the oil macadam properly and supply materials for reoiling, this contract was ordered. At a number of points between Arlington and Pendleton the grade line is low across several swales where irrigation water collecting softened the roadbed. These places were scarified and reshaped and approximately 15 cubic yards per 100 feet of 1¼-inch rock was placed. The scarifying, blading and other roadwork was performed by state forces.

West Unit, Pendleton-Kamela Maintenance Materials

On the Old Oregon Trail Highway, from Mile Post 232.7 at the east city limits of Pendleton to Mile Post 256.0 in the Blue Mountains three miles east of Dead Man's Pass; 22.6 miles of maintenance materials in stock piles and in trucks.

[UMATILLA]

Contract No. 1,000, awarded September 27, 1927, to Wren & Greenough, of Portland, Oregon. Work commenced February 20, 1928; completed July 31, 1928. Final cost, $47,311.34. Resident Engineers, C. E. Carter and Oscar Cutler.

This contract was authorized to supply maintenance materials for oiling and reoiling. The winter of 1927-1928 was unusually severe and at several points the highway developed weak spots. The output of materials was increased approximately 9,000 cubic yards in order that materials might be available to place on the highway where it was evident they were needed. At several points the roadbed was scarified, reshaped and 15 cubic yards of one and one-quarter-inch rock per 100 feet was added. The scarifying, blading and other work was performed by state forces.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,372.29
Hauling and constructing surfacing by state forces		6,162.02
Supplies and equipment rental deducted from contractor's estimate		264.75
Purchase of quarry site		218.00
Preparing stock pile sites		675.89
Credit for materials stock piled for betterment work		Cr. 15,925.00
Contract items as follows:		
Grade "A" materials in stock pile, 5,291.4 cu. yds. at $1.89	$10,000.75	
Grade "B" materials in stock pile, 4,873.2 cu. yds. at $1.89	9,210.35	
Grade "C" materials in stock pile, 4,087.1 cu. yds. at $1.89	7,724.62	
Grade "C" materials stock piled at quarry, 4,948.5 cu. yds. at $1.40	6,927.90	
Grade "D" materials stock piled at quarry, 950.8 cu. yds. at $1.40	1,331.12	
Excess stock pile haul, 556.1 yd. mi. at 20c	111.22	
Grade "B" materials in trucks, 395.0 cu. yds. at $1.50	592.50	
Grade "C" materials in trucks, 4,284.0 cu. yds. at $1.50	6,426.00	
Grade "D" materials in trucks, 3,676.0 cu. yds. at $1.25	4,595.00	
Waste materials used for binder, 1,222.0 cu. yds. at 30c	366.60	
Truck haul, 36,052.9 yd. mi. at 18c	6,489.52	
Force account items:		
Preparing stock pile sites	32.56	
Total amount earned by contractor	$53,808.14	
Deduction for supplies and equipment furnished by state	264.75	
Total amount paid to contractor		53,543.39
Grand total cost of project, all state funds, 1927-28		$47,311.34

DETAIL OF BETTERMENT ITEMS TRANSFERRED

Grade "A" broken stone, 2000.0 cu. yds. at $1.89	$ 3,780.00
Grade "B" broken stone, 1,500.0 cu. yds. at $1.89	2,835.00
Grade "C" broken stone, 1,000.0 cu. yds. at $1.89	1,890.00
Grade "C" broken stone, 4,500.0 cu. yds. at $1.40	6,300.00
Grade "D" broken stone, 800.0 cu. yds. at $1.40	1,120.00
Total	$15,925.00

Pilot Rock-Freewater Maintenance Materials "B"

On the Oregon-Washington Highway, near Pilot Rock to the state line north of Freewater; 20 miles of maintenance materials in stock piles.

Contract No. 994, awarded August 30, 1927, to H. E. Schmeer, of Portland, Oregon. Work commenced September 15, 1927. Estimated cost, $25,000, from state funds. Expenditures to date, $13,014.75. Resident Engineer, C. E. Carter.

This contract covered that portion of the materials left when the Pacific Construction Company of Portland became unable to complete their contract No. 932.

[UMATILLA]

Purchase of Property at East City Limits of Pendleton

At the Junction of the Old Oregon Trail and Oregon-Washington Highways.

At the east city limits of Pendleton the Old Oregon Trail and Oregon-Washington Highways form a junction partly in a roadbed cut. In order that a high bank might be removed and improve the sight distance, and also to prevent the erection of sign boards or other obstructions which if erected would prove an additional hazard, it was decided to purchase a tract of land, which has been done. Under present plans the removal of the gravel and dirt bank will be undertaken in 1929.

Emigrant Springs Park

On the Old Oregon Trail Highway, 26 miles east of Pendleton, in the Blue Mountains.

During the 1923-1924 biennium the State Highway Commission acquired a tract of approximately 14 acres of land in the Blue Mountains 26 miles east of Pendleton, known as Emigrant Springs, from several springs which rise at this point. This place was a landmark on the Old Oregon Trail, and according to Ezra Meeker of Old Oregon Trail fame, who stopped at the park two years ago, was known in the early days of the Old Oregon Trail as Lee's Encampment, due to the fact that Jason Lee, one of the early pioneer missionaries to the Oregon country, camped at this spot.

During the past biennium a log building has been erected on the grounds, a pump house for water and lights, a water storage tank, and driveways; also additional camp stoves have been installed. The log building erected on the grounds has rest rooms in the basement and the main floor is used as a lunch room and small store. A concession was let in February, 1928, to a Mrs. Lucille Gray for a three-year period, who operates the concession, and who, under the contract, is required to maintain the rest rooms and main lobby for the free use of the public. The operation of the camp ground is handled by a caretaker who keeps the grounds clean and looks after the camping, tables and garbage. During 1927 an additional tract of 40 acres adjoining to the south was purchased and a portion of this tract was improved by cutting the dead underbrush and trees, providing additional camping space which was needed as the camp grounds are becoming increasingly popular with tourists.

A statement covering the construction and cost of the park building is given in a separate article in this report.

See page 435 of the 1923-1924 report and further details will be found on page 425 of the 1925-26 report.

Emigrant Springs Park Building

On the Old Oregon Trail Highway, between Meacham and La Grande; 28 by 56-foot log house.

Contract No. 972, awarded April 19, 1927, to Frick & Belvail, of Pendleton, Oregon. Work commenced May 12, 1927; completed December 15, 1928. Estimated cost, $25,655.43. Resident Engineer, C. H. Hubbard.

[UMATILLA]

Native logs were used in the construction of this building, which is to be used as park headquarters to accommodate the large volume of tourist traffic using the park. The exterior of the building is made of logs, none of which is smaller than 12 inches in diameter. The interior as well as the exterior of the building shows the natural surface of the logs.

The building is equipped with a lighting plant and a water supply and sewage disposal system. Water is pumped from a spring on the park.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,965.76
Labor and materials furnished by state:		
Clearing and grubbing		42.63
Kohler lighting plant		943.50
Fairbanks-Morse Pump		130.31
Lighting fixtures		392.53
Hardware		325.35
Contract items as follows:		
Park building, lump sum	$18,799.54	
Concrete, 6.4 cu. yds. at $22.00	140.80	
Force account items:		
Changing slop sink	28.61	
Making necessary water supply connections	25.51	
Constructing man-hole in water tank	15.97	
Changing lighting fixtures	6.74	
Furnishing 18-inch logs for porch beams and posts	196.35	
Furnishing and hanging shutters on pump house	59.99	
Clearing water-tank site and furnishing water line connections	21.48	
Constructing lath and plaster in sink room	95.49	
Constructing extra doors	23.65	
Changing location of gasoline tank	9.21	
Varnishing interior log walls	982.80	
Total amount earned by contractor	$20,406.14	
Less retained percentage	612.18	
Total amount paid to contractor		19,793.96
Grand total expended on structure, all state funds, 1927-28		$23,594.04

Patrol Headquarters at Meacham

On the Old Oregon Trail Highway, at Meacham.

During the 1925-1926 biennium, the State Highway Commission secured a tract of land at Meacham, on which there has been erected a dwelling house for the patrolmen, and an equipment shed to house trucks, snow plows, etc. There was also included in the equipment shed a workshop and bunk house for emergency employes during winter snow removal work. During the 1927-1928 biennium, in addition to completing the buildings, the tract has been fenced, the storage yard graveled and a lawn planted around the dwelling house. A well was drilled upon the property and an adequate supply of water secured. A small motor was installed which furnishes electric lights and operates the well pump.

The necessity of establishing a patrol headquarters at this point has been recognized since the highway was completed. There were no facilities for equipment storage, nor could a suitable dwelling be secured for the patrolmen.

This section is of extreme importance as during the winter months the snowfall is quite heavy, and to allow the highway to become blocked by snow would disrupt traffic for all of the counties in the extreme eastern part of the state.

Further details will be found on page 426 of the 1925-26 report.

[UMATILLA]

Patrolman's Quarters and Equipment Shed at Meacham

On the Old Oregon Trail Highway, at Meacham; securing of property and construction of buildings.

Contract No. 910, awarded July 29, 1926, to O. N. Pierce. of Portland, Oregon. Completed July 10, 1927. Final cost, $18,537.19. Resident Engineer, M. Stephenson.

This plant includes a dwelling house for the patrolmen as well as equipment storage space and shop for the repair of maintenance equipment. A bunk house is built into the equipment shed to house the snow removal crews stationed here each winter.

Further details will be found on page 426 of the 1925-26 report.

Detailed Statement of Expenditures

Engineering		$ 630.01
Labor and materials furnished by state:		
Drilling well and installing fittings		1,414.70
Clearing, grading and fencing grounds, installing sewers and upkeep of grounds		5,786.30
Installing lighting, heating and plumbing fixtures and maintenance of buildings		3,247.58
Patrolman's Quarters and Equipment Shed, Contract No. 910		
Contract items as follows:		
Exavation, 27.67 cu. yds. at $2.00	$ 55.34	
Concrete, 27.79 cu. yds. at $24.00	666.96	
Patrolman's quarters, lump sum	2,576.00	
Equipment shed, lump sum	2,180.00	
Force account items:		
Building bunk house and stairway in equipment shed	720.69	
Wiring house and equipment shed for electric lights	194.35	
Substitution of 16-gauge for 14-gauge weather strip	4.73	
Total amount earned by contractor	$ 6,398.07	
Deductions:		
Labor and materials furnished by state	15.00	
Adjustment on plaster board, account of quality	71.00	
Total amount paid to contractor		6,312.07
Pump House and Woodshed, Contract No. 996		
Contract items as follows:		
Pump house and woodshed, lump sum	$ 890.00	
Force acount items:		
Constructing septic tank	81.17	
Placing wood floor in pump house	29.57	
Constructing shelter for gas pump	145.79	
Total amount paid to contractor		1,146.53
Grand total cost of structure, all state funds		$ 18,537.19

Segregation of Funds

Expended 1925-26 biennium	$ 2,707.65
Expended 1927-28 biennium	15,829.54
Total	$18,537.19

[UMATILLA]

Dead Man's Pass-Union County Line Timber Purchase

On the Old Oregon Trail Highway, from a point approximately 17 miles east of Pendleton to the Union County line at the summit of the Blue Mountains.

The acquisition of a strip of land from 500 feet to 1,000 feet in width to preserve standing timber adjacent to the Old Oregon Trail in the Blue Mountains was decided upon by the State Highway Commission during the 1925-1926 biennium, and the negotiations for and purchase of the land was ordered. During 1927 and 1928 approximately 75 per cent of the property required has been secured. Approximately 25 per cent of the property desired is on the Umatilla Indian Reservation. After many conferences between representatives of the United States Indian Service, representatives of the Indians themselves and with State Highway Commission officials, a satisfactory agreement has been reached and the necessary papers to complete the transaction are in the hands of the United States Government officials with the probability that the matter will be concluded shortly.

On that portion of the land acquired, state forces have been engaged in cutting dead trees, piling and burning brush and logs, and removing old snags and stumps. This work is primarily to remove the fire hazard as well as to improve the grounds. During the past summer, during the fire season, a one-man fire patrol was also maintained and several fires were discovered and put out before any damage was caused. The foreman on this work was Wm. Wilkinson. Oscar Cutler was Resident Engineer in charge.

The negotiations for timber purchase were in general handled by E. G. Bickmore of the La Grande division office.

Further details will be found on page 426 of the 1925-26 report.

Athena Service Buildings

On the Oregon-Washington Highway, at Athena 24 x 44-foot frame construction service building.

Contract No. 898, awarded June 24, 1926, to W. C. Kelly, of La Grande, Oregon. Completed November 1, 1926. Final cost, $1,692.91, from state funds. Resident Engineer, M. Stephenson.

Further details will be found on page 425 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 86.59
Preparation of building site		160.91
Miscellaneous hardware furnished by the state		110.28
Contract items as follows:		
Building, complete	$ 1,298.00	
Force account items:		
Furnishing additional lumber and bolts	37.13	
Total amount paid to contractor		1,335.13
Grand total cost of project, all state funds		$ 1,692.91

SEGREGATION OF FUNDS

Expended 1925-26 biennium	$ 309.95
Expended 1927-28 biennium	1,382.96
Total	$1,692.91

[UMATILLA]

Sturgis Quarry Site

On the Old Oregon Trail Highway, eight miles west of Pendleton.

This tract of land which is adjacent to the Old Oregon Trail eight miles west of Pendleton, was purchased as a permanent quarry site, as there is located thereon a high bluff of rock containing several hundred thousand cubic yards of rock which when crushed forms an excellent surfacing material for macadam or oiling purposes.

Nolin Line Change Survey

This survey was made in the early summer of 1927 and was for the purpose of determining the feasibility of eliminating the excessive curvature on the Old Oregon Trail at Nolin, and also to provide a grade separation from the highway and a county road leading from the hills north of the Umatilla River to Nolin on the O.-W. R. R. & N. The grade separation is desirable as many wheat wagons with long strings of horses and two or more wagons cross the highway. This revision will probably be constructed as soon as funds become available.

Lazinka Ranch-Albee Construction Engineering

This prefix was assigned to handle the engineering cost on this section. The grading work was performed by Umatilla County construction forces and was financed from funds supplied by Umatilla County.

Lazinka Ranch-Albee Prospecting for Surfacing Materials

On the Pendleton-John Day Highway, from Lazinka Ranch to a point near Albee, forming a junction with a section constructed by the U. S. Forest Service.

Resident Engineer, W. W. Stiffler.

This job number was assigned to enable charges in connection with preliminary engineering and development of quarries, to be properly placed on the books. A contract for the surfacing work has not been let.

UNION COUNTY

Union County is largely of a mountainous nature with one large valley and numerous small valleys along the small streams. The largest valley is called the Grande Ronde from its circular appearance and is practically surrounded by high mountains. It was named by the early French Canadian trappers of the Hudson Bay Company. Early explorers and emigrants commented upon the appearance of the valley and many thought it would some day support a thriving agricultural community. That day has come and many fine farms and several towns or cities are within the valley. The Old Oregon Trail traverses the county from northwest to south, and the La Grande-Wallowa Lake Highway from the central part of the county to the east boundary.

The highway system in the county was completed in previous years. Traffic on the Old Oregon Trail has increased to the point where it has now become necessary to widen and resurface the Old Oregon Trail from the Umatilla County line at the summit of the main ridge of the Blue Mountains to La Grande, and this work will probably be done during the 1929-1930 biennium.

The State Highway Commission authorized the purchase of land adjacent to the highway in the Blue Mountains and in the Minam Canyon so that the standing timber would be preserved; several tracts varying in width from 300 to 1,000 feet have been purchased, and the purchase of the other tracts should be completed during the 1929-1930 biennium.

All work on the state highway system is under the direction of H. G. Smith, Division Engineer, La Grande, Oregon.

Division Office Building at La Grande, Oregon

On the Old Oregon Trail Highway, in La Grande.

The work in the La Grande division office having reached the point where additional office space was necessary and in order to eliminate the necessity of paying rent, a division office building was constructed on property deeded by the city of La Grande and the county of Union to the State of Oregon. This property is located at the corner of Adams avenue and Willow streets, at the east city limits of La Grande. The building was constructed as a part of a contract in which several other buildings were erected. Engineering supervision was handled by the bridge department, M. Stephenson being the Resident Engineer in charge.

The building is not yet ready for occupancy but it is expected that it will be ready before January 1, 1929.

Expenditures to date have amounted to $7,689.42 from state funds.

Gangloff Park

On the Old Oregon Trail Highway, at the west city limits of La Grande. Resident Engineer, Oscar Cutler.

This park site was given to the state by Mrs. Mary Foley, a pioneer of the Grande Ronde Valley. It lies at the west city limits of La Grande and overlooks the city and valley.

Some improvements have been made, such as fencing, grading and graveling a turn-out, a few trees planted and the ground seeded to grass.

[UNION]

Extensive landscaping is not practicable until such time as water is piped upon the ground.

Further details will be found on page 444 of the 1923-24 report and page 430 of the 1925-26 report.

Maintenance

In Union County there are 83.62 miles of state highway, all of which are under maintenance by state forces; 48.53 miles being on the Old Oregon Trail, of which 5.3 miles are of asphaltic concrete pavement and 43.23 miles are of oil-treated macadam. On the La Grande-Wallowa Lake Highway there are 35.09 miles, of which 2 miles are asphaltic concrete, 5.2 miles of bituminous macadam, 12.8 miles of oil-treated macadam and 15.09 miles of untreated macadam.

During the 1927-1928 biennium there were crushed for maintenance purposes approximately 40,050 cubic yards of rock and gravel. Some special ditching for drainage and slope protection was done on the La Grande-Wallowa Lake Highway, and one section of 600 feet of Telford base was placed across a swamp where the surface was continually rough.

Special ditching, slope protection, reoiling and guard fence were handled by extra gangs under special foremen. Extra gang foremen were F. B. Hurt, F. W. Churchill, Roland Hopper, W. H. Stewart, Harrison Davis, Joe Garney and Wm. Wilkinson.

This county is in the center of the snow belt in Eastern Oregon and snow removal from the highways is an important part of the maintenance work. The formation of drifts is one of the chief difficulties and the remedy for this is the erection of snow fences. In many instances drifting occurs from cultivated fields and it is necessary that the fence be easily moved; a fence constructed of wire and ½ by 6-inch boards approximately six feet in length fastened to posts driven in the ground was made up and tried with excellent results. When it is not necessary to move the snow fence a more permanent type is used. It is increasingly apparent that in nearly all cases it would be economy to purchase a strip of land approximately 60 feet in width adjacent to the highway at points where drifts occur, as the yearly cost of moving the snow fence would pay for the land in a short period of time. The removal of snow from the highway is accomplished by means of graders drawn or propelled by motive power, truck plows mounted on trucks, plows mounted on tractors, and by special rotary plows handled by the regular maintenance crews or special operators.

The maintenance organization in Union County consists of the following sections and patrolmen: Umatilla County line to Mile Post 274.7 on the Old Oregon Trail, Helmer Olsen, with headquarters at Meacham; from Mile Post 274.7 to La Grande on the Old Oregon Trail and from La Grande to Elgin on the La Grande-Wallowa Lake Highway, George J. Ferree, with headquarters at La Grande; from La Grande to the Baker County line on the Old Oregon Trail, N. D. Johnson, with headquarters at Union; from Elgin to the Wallowa County line on the La Grande-Wallowa Lake Highway, W. H. Miller, with headquarters at Minam.

[UNION]

Supervision of maintenance is under the direction of Oscar Cutler, Division Office Engineer, with the exception of the portion of the Old Oregon Trail from La Grande to Baker County line, which is under the direction of J. N. Bishop, Resident Maintenance Engineer, with headquarters at Baker. H. G. Smith, Division Engineer, is in general charge of all maintenance. R. H. Baldock is State Maintenance Engineer.

La Grande-Baker Maintenance Materials

On the Old Oregon Trail Highway, from La Grande to Baker; 48 miles of maintenance materials in stock piles.

Contract No. 947, awarded March 3, 1927, to H. J. Hildeburn, of Portland, Oregon. Work commenced July 27, 1927; completed August 23, 1928. Final cost, $55,539.94. Resident Engineer, J. N. Bishop.

In order to continue the proper maintenance of this section of highway, this contract was let to supply crushed rock or gravel. The contractor became financially embarrassed and abandoned the contract. The Independent Indemnity Company who had furnished the bond proceeded to carry out the work, subletting to Hart Brothers of Union, Oregon, who completed the contract. The original contractor completed approximately 57 per cent and the Surety Company or their representatives completed approximately 43 per cent of the contract.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,017.75
Purchase of gravel pits		920.60
Lease of stock pile sites		249.61
Preparation of stock pile sites		101.69
Contract items as follows:		
Grade "A" materials in stock pile, 5,791.2 cu. yds. at $2.55	$14,767.56	
Grade "B" materials in stock pile, 6,349.3 cu. yds. at $1.95	12,381.14	
Grade "C" materials in stock pile, 4,738.1 cu. yds. at $2.15	10,186.92	
Grade "D" materials in stock pile, 6,852.0 cu. yds. at $1.75	11,991.00	
Grade "E" materials in stock pile, 479.5 cu. yds. at $1.75	839.13	
Grade "X" materials in stock pile, 167.1 cu. yds. at $2.00	334.20	
Grade "F" materials in stock pile, 3,792.8 cu. yds. at $1.75	6,637.40	
Grade "A" materials in trucks, 105.3 cu. yds. at $1.75	184.28	
Grade "B" materials in trucks, 75.7 cu. yds. at $1.50	113.55	
Grade "C" materials in trucks, 93.0 cu. yds. at $1.60	148.80	
Force account items:		
Preparation of stock pile sites	134.46	
Digging test pits for gravel	24.74	
Total amount earned by contractor	$57,743.18	
Deductions:		
Haul adjustment	$ 3,876.90	
Retained percentage	1,615.99	
Total amount paid to contractor		$ 52,250.29
Grand total expended on project, all state funds, 1927-28		$ 55,539.94

La Grande-Minam Resurfacing and Maintenance

On the La Grande-Wallowa Lake Highway, from La Grande north city limits to Mile Post 30.3, near the top of the Minam grade; 10.2 miles of surfacing and 30.3 miles of maintenance materials in stock piles.

Contract No. 966, awarded March 29, 1927, to Joslin & McAllister, of Spokane, Washington. Work commenced May 12, 1927; completed May 15, 1928. Final cost, $72,903.77. Resident Engineer, E. B. Loken and Oscar Cutler.

[UNION]

The surfacing on the section between Elgin and the top of the Minam grade had become worn to the extent that it was necessary to resurface before oil could be applied with satisfactory results. This contract also provided sufficient maintenance materials to reoil between Island City and Elgin and to oil approximately six miles of the resurfaced section.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 5,486.40
Labor and materials furnished by the state:		
Widening roadbed		1,012.60
Sprinkling surfacing materials		2,440.65
Preparing stock pile sites		124.91
Signs for control of traffic		32.80
Purchase of quarry sites		368.50
Lease of storage sites		100.00
Fencing quarry sites		73.21
Hauling and constructing surfacing		4,817.07
Credit for materials used in bituminous macadam construction		Cr. 3,802.31
Contract items as follows:		
Broken stone sub-surfacing, 4,193.0 cu. yds. at $1.70	$ 7,128.10	
Base course resurfacing, 6,001.0 cu. yds. at $1.88	11,281.88	
Top course resurfacing, 4,087.0 cu. yds. at $2.20	8,991.40	
Grade "A" materials in stock pile, 2,936.0 cu. yds. at $1.98	5,813.28	
Grade "B" materials in stock pile, 3,697.9 cu. yds. at $1.94	7,173.93	
Grade "C" materials in stock pile, 5,532.7 cu. yds. at $1.94	10,733.44	
Grade "D" materials in stock pile, 1,860.8 cu. yds. at $1.84	3,423.87	
Grade "A" materials in trucks, 264.0 cu. yds. at $1.40	369.60	
Grade "B" materials in trucks, 1,019.5 cu. yds. at $1.40	1,427.30	
Top course maintenance materials, 648.7. cu. yds. at $1.40	908.18	
Base course maintenance materials, 1,032.5 cu. yds. at $1.30	1,342.25	
Extra haul, stock pile measure, 3,646.45 yd. mi. at 22c	802.22	
Extra haul, truck measure, 1,222.7 yd. mi. at 18c	220.09	
Earth filler, 3,705.0 cu. yds. at 30c	1,111.50	
Filler haul, 3,505.25 yd. mi. at 20c	701.05	
Common embankment, 615.8 cu. yds. at 60c	369.48	
Intermediate embankment, 304.2 cu. yds. at 80c	243.36	
Embankment haul, 34.0 yd. mi. at 22c	6.80	
Stripping filler pits, 134.7 cu. yds. at 25c	33.68	
Force account items:		
Digging out soft material in subgrade	46.52	
Moving snow fences out of way of grader	27.34	
Reconstructing private water pipe line, Station 1299	14.50	
Repairing banks of Dry Creek to confine water	41.22	
Moving rock checkers' quarters from camp to camp	38.95	
Total amount paid to contractor		$ 62,249.94
Grand total cost of project, all state funds, 1927-28		$ 72,903.77

La Grande-Hot Lake Right of Way

On the Old Oregon Trail Highway, from the east city limits of La Grande to Hot Lake; eight miles of extra width right of way.

This portion of the Old Oregon Trail traverses a flat section of the Grande Ronde Valley which is subject to very heavy winds in the winter. There is also considerable snowfall which drifts upon the highway. The soil is very light and when plowed late in the fall will also drift with the snow, filling the ditches and blocking the highway. In order to secure relief from this condition, it has been decided to purchase a strip of land on which to plant trees and erect snow fence. At the close of the biennium some surveys have been made, but maps and other papers have not been prepared. Mr. E. G. Bickmore has been in charge of surveys, plans and other negotiations. Development work is under the supervision of J. N. Bishop, Resident Maintenance Engineer.

[UNION]

Umatilla County Line-Hilgard Timber Purchase

On the Old Oregon Trail Highway, from Union-Umatilla County line to Hilgard; 12.5 miles of timber purchase.

During the 1925-1926 biennium, the State Highway Commission decided to purchase the land and standing timber on a strip 300 to 1,000 feet in width on this section. During the 1927-1928 biennium the surveys have been completed, and a considerable portion of the land purchased.

In addition, on the land acquired, the dead trees, snags and dead underbrush have been cut and burned, improving the appearance and removing a dangerous fire menace. A one-man forest fire patrol was maintained in this section during the dangerous months with good results. Wm. Wilkinson was foreman on this work. Oscar Cutler was Resident Engineer. The negotiations for timber purchase were handled for the most part by E. G. Bickmore.

Further details will be found on page 429 of the 1925-1926 report.

La Grande-Wallowa County Line Timber Purchase

On the La Grande-Wallowa Lake Highway, from the top of the Minam grade approximately 10 miles east of Elgin to the Wallowa County line, 4.5 miles of timber purchase.

The purchase and preservation of a strip of timber land adjacent to the La Grande-Wallowa Lake Highway on what is known as the Minam Grade was authorized by the State Highway Commission during the preceding biennium. Due to pressure of other work little has been accomplished on this. Some surveying and preparation of plats has been undertaken, and one or two property owners interviewed. It is hoped that the acquisition of this land can be completed in 1929. Mr. E. G. Bickmore has been in charge of surveys, plans and other negotiations. Development work is under the supervision of Oscar Cutler.

Umatilla County Line-Hilgard Survey

The grading of this section was contemplated in 1921 and the original surfacing in 1922. Owing to a scarcity of funds the roadbed was graded to a width of 18 feet only and surfaced 16 feet in width. This width was sufficient for the traffic which the road carried at the time. The traffic has now increased to the point where this section of highway is called upon to accommodate from 500 to 600 cars daily during the tourist season. The section has not been resurfaced since originally constructed but the surface is nearly worn out.

This survey was made to determine the cost of regrading and resurfacing this section to modern standards.

Elgin-Minam Hill Survey

The grading and surfacing of the Elgin-Top of Minam Grade was completed, the grading in 1919 and the surfacing in 1921. It became necessary to resurface this section, and in March, 1927, a contract was let for this purpose. On the Elgin Hill a sharp curve occurs and this survey was made to determine the possibility of revising the alignment. This revision was not constructed as funds were not available.

[UNION]

Elgin-Weston Reconnaissance

This investigation was commenced during the summer and fall of 1928. This is a forest road project but the opinion of the Oregon State Highway Department has been requested by the government officials.

The purpose of the investigation is to determine the most feasible route from the toll gate, at the summit of the Blue Mountains at the Umatilla-Union County line, to the Grande Ronde Valley. There are several routes which indicate they may have possibilities. The investigations made at the present time indicate that the Little Phillips Creek route is the most feasible. The investigation so far has been made by Mr. E. G. Bickmore of the La Grande division office.

WALLOWA COUNTY

Wallowa County forms the northeast corner of the state, which is a section of high mountains and deep canyons with many swiftly flowing streams, and in the south portions many mountain lakes. The county is a favorite summer play-ground for most of northeastern Oregon, and the La Grande-Wallowa Lake Highway, the main artery of travel into the county carries an ever-increasing traffic from year to year.

Another highway which will be of importance to Wallowa County when completed in Oregon and Washington is the Enterprise-Lewiston Highway, which will afford direct connections from Wallowa County to Lewiston in Idaho and Spokane in Washington.

The La Grande-Wallowa Lake Highway was completed during previous years, and the Enterprise-Flora Highway to a point near Flora during the 1927-1928 biennium. The last section constructed was by the United States Forest Service and Wallowa County, a section nine miles in length. To complete the highway to the Washington state line will require the construction of approximately seven miles. A reconnaissance survey has been made of this section but other work remains to be done.

On the La Grande-Wallowa Lake Highway from Rock Creek at the head of the Wallowa Canyon to Wade's Ranch, two miles from Lostine, the highway was resurfaced during the biennium.

All work in Wallowa County is under the direction of H. G. Smith, Division Engineer, with headquarters at La Grande.

Lostine-Enterprise Grading and Surfacing

Federal Aid Project No. 70

On the La Grande-Wallowa Lake Highway, from a point approximately two miles east of Lostine to Enterprise; 7.89 miles of grading and surfacing.

Contract No. 570, awarded July 26, 1922, to Wallowa County Court, of Wallowa County. Work commenced September 18, 1922; completed November 17, 1923. Final cost, $116,797.60.

This project has been opened during the present biennium to record a receipt of $1,118.50 from Wallowa County to apply on the county's cooperative share. This makes a total county payment to date of $37,001.86, leaving a balance of $18,073.54 to complete the county's share.

Further details will be found on page 434 of the 1925-26 report.

Unit 1, Enterprise-Forest Boundary Surfacing

On Enterprise-Flora Highway, from the intersection of North street and West First street in the city of Enterprise to a point approximately 7.5 miles north of Enterprise, connecting with Enterprise Forest Boundary Unit No. 2; 7.59 miles of surfacing.

Contract No. 894, awarded June 24, 1926, to Joslin & McAllister, of Spokane, Washington. Work commenced August 21, 1926; completed November 10, 1926. Final cost, $34,424.36. Resident Engineer, W. C. Williams.

The surfacing of this section and the grading and surfacing of a section nine miles in length north of the Wallowa National Forest by the United States Forest Service completes a graded and surfaced highway from Enterprise to a point approximately two miles east of Flora, being

[WALLOWA]

a distance of approximately 35 miles. This highway will in time be extended to the Washington state line, affording a direct connection with Washington Highways and connecting Wallowa County directly with Lewiston, Idaho.

Further details will be found on page 433 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 1,645.79
Sprinkling surfacing materials by state forces		1,563.12
Royalty for surfacing materials		668.00
Credit by transfer to special maintenance		Cr. 1,196.36
Contract items as follows:		
Sub-base course surfacing, 1,740 cu. yds. at $1.68	$ 2,923.20	
Base course surfacing, 6,165.0 cu. yds. at $1.68	10,357.20	
Top course surfacing, 7,295.0 cu. yds. at $1.68	12,255.60	
Maintenance materials, 2,587.6 cu. yds. at $1.10	2,846.36	
Common filler, 3,206.0 cu. yds. at 20c	641.20	
Screened filler, 2,405.0 cu. yds. at 30c	721.50	
Filler haul, 7,995.0 yd. mi. at 25c	1,998.75	
Total amount paid to contractor		31,743.81
Grand total cost of project		$34,424.36

PARTICIPATION IN COST

	State	*County*	*Total*
Expended 1925-26 biennium	$17,916.17	$ 3,194.85	$21,111.02
Expended 1927-28 biennium	258.19	13,055.15	13,313.34
Total of expenditures	$18,174.36	$16,250.00	$34,424.36

Flora Forest Road Project

This project has extended over from the previous biennium and a descriptive article will be found on page 433 of the last biennial report.

The grading and surfacing were handled under the supervision of the Bureau of Public Roads and were completed late in 1927. The grading was under contract to the Security Construction Company of La Grande and the surfacing was performed by Joslin & McAllister of Spokane. The project was built to the 14-foot standard of the Bureau of Public Roads.

State expenditures during the biennium have amounted to $12,000. The completed work now represents a total expenditure of $100,451.27, of which the state has paid $12,000, and the county $12,000 and the federal government $76,451.27.

The expenditures given do not cover the cost of grading 2.5 miles at the north end of the work, this being done by Wallowa County at its own expense.

Maintenance

There are 64.72 miles of state highway in Wallowa County under maintenance by state forces at the close of the 1927-1928 biennium, of which 38.28 miles are on the La Grande-Wallowa Lake Highway and 26.64 miles on the Enterprise-Flora Highway; all of this mileage being surfaced.

On the La Grande-Wallowa Lake Highway there were manufactured for maintenance purposes 12,400 cubic yards of maintenance materials. From Rock Creek to Lostine state forces using tractor and grader widened the grade and reconstructed the drainage ditches. This work was performed in connection with the resurfacing of the roadbed.

[WALLOWA]

The maintenance sections and patrolmen in charge in this county during the biennium were, on the La Grande-Wallowa Lake Highway from the Union County line to Wallowa Canyon fountain, W. H. Miller, with headquarters at Minam; from the Wallowa Canyon fountain to Gwynne Siding, J. I. Skillings, with headquarters at Wallowa; and from Gwynne Siding to Joseph and on the Enterprise-Flora Highway from Enterprise to the north boundary of the Wallowa National Forest, F. J. Berry and A. J. Strader, successively.

Supervision of maintenance work in Wallowa County has been under the direction of Oscar Cutler, Division Office Engineer, La Grande. H. G. Smith, Division Engineer at La Grande, is in general charge of all maintenance in the division. R. H. Baldock is State Maintenance Engineer.

Rock Creek-Lostine Resurfacing and Maintenance Materials

On the La Grande-Wallowa Lake Highway, from Rock Creek at the head of the Wallowa Canyon to Wade's Ranch, approximately two miles east of Lostine; 15.7 miles of resurfacing and 25 miles of maintenance materials.

Contract No. 927, awarded October 26, 1926, to Joslin & McAllister, of Spokane, Washington. Work commenced December 10, 1927; completed May 15, 1928. Final cost, $87,446.56. Resident Engineers, E. B. Loken and Oscar Cutler.

The resurfacing of this section was completed in 1927 and passed through the winter of 1927-1928 in condition to warrant that oil be applied in 1929. The maintenance materials stock piled will be used for oiling purposes.

Detailed Statement of Expenditures

Engineering		$ 6,365.59
Lease of filler pits		325.00
Purchase of quarry sites		1,667.83
Widening of roadbed by state forces		3,680.65
Sprinkling surfacing materials		2,551.20
Temporary lease of ground for detour power line location		20.00
Fencing filler pits and quarry sites		331.26
Contract items as follows:		
Broken stone sub-surfacing, 8,863.0 cu. yds. at $1.78	$15,776.14	
Base course resurfacing, 9,920.5 cu. yds. at $1.78	17,658.49	
Top course resurfacing, 9,142.0 cu. yds. at $1.78	16,272.76	
Grade "A" maintenance materials, 2,823.7 cu. yds. at $1.67	4,715.58	
Grade "B" maintenance materials, 7,144.0 cu. yds. at $1.32	9,430.08	
Earth filler, 7,996 cu. yds. at 25c	1,999.00	
Filler haul, 17,582.5 yd. mi. at 20c	3,516.50	
Embankment of common materials, 2,307.9 cu. yds. at 60c	1,384.74	
Embankment of intermediate materials, 187.9 cu. yds. at 60c	112.74	
Embankment of solid rock, 40.4 cu. yds. at $2.00	80.80	
12-inch corrugated galvanized iron pipe, 46 lin. ft. at $2.00	92.00	
18-inch corrugated galvanized iron pipe, 66 lin. ft. at $3.00	198.00	
Embankment haul, 2,997.0 yd. mi. at 20c	599.40	
Stripping filler pits, 818.9 cu. yds. at 25c	204.73	
Force account items:		
Constructing fences around rock quarries and filler pits	204.89	
Back filling filler pit to permit drainage	93.06	
Reinforcing irrigation dam to prevent seepage under highway	13.69	
Preparing stock pile site	126.47	
Moving rock checkers' quarters, total of 22 miles	25.96	
Total amount paid to contractor		72,505.03
Grand total cost of project, all state funds, 1927-28		$87,446.56

[WALLOWA]

Unit 1, Enterprise-Forest Boundary Maintenance Materials

On the Enterprise-Flora Highway, from a point 7.5 miles north of Enterprise to the north boundary of the Wallowa National Forest; 19 miles of maintenance materials.

A part of contract No. 894, awarded June 24, 1926, to Joslin & McAllister, of Spokane, Washington. Work commenced August 21, 1926; completed November 10, 1926. Final cost, $1,196.36. Resident Engineer, W. C. Williams.

The maintenance materials secured under this project are for use on the section adjoining on the north of Unit No. 1 of the Enterprise-Flora Highway. The maintenance materials on the section to the north had become exhausted.

A total of 1,087.6 cubic yards of crushed rock were produced for this project.

Union County Line-Wallowa Lake Timber Preservation

On the La Grande-Wallowa Lake Highway, from the Union-Wallowa County line to Rock Creek, approximately four miles from Wallowa; 10 miles of timber purchase.

During the 1925-1926 biennium the State Highway Commission authorized the acquisition of several tracts of land and timber adjacent to the La Grande-Wallowa Lake Highway in the Wallowa Canyon. The highway follows the Wallowa River through a rugged and picturesque canyon, and the purpose of the land and timber purchase is to preserve the natural beauty of the landscape.

Surveys have been made of several tracts. Maps and other papers prepared in certain cases and some property acquired. Mr. E. G. Bickmore is in charge of surveys and other negotiations. Development work is under the supervision of Oscar Cutler, Resident Maintenance Engineer.

Flora-Washington State Line Reconnaissance

This investigation was started in the summer of 1928 by W. C. Williams, but has not been completed. Its purpose is to find a feasible route from the end of the constructed highway near Flora, to the Washington state line, forming a junction with a survey now under way by the State of Washington, southwesterly from Antone, Washington, crossing the Grande Ronde River Canyon. This is a rough and rugged country and considerable investigation will be necessary. The investigation so far indicates that the Buford Creek route is the shortest by approximately four miles, with less curvature and easier construction on the Oregon portion. The finding of the shortest practical route is desirable as this highway will become an important through route from Enterprise and Wallowa County to Lewiston in Idaho.

WASCO COUNTY

All portions of the state highway within the county are completed and surfaced, either with bituminous pavement or oiled macadam. The Columbia River Highway has not undergone any change since the last report. All sections of The Dalles-California Highway in this county are now oiled and with few exceptions are in good condition.

The activities in this county during this biennium has been confined nearly entirely to maintenance and betterment work, the large part of which was oiling and patching the oiled roadway. The new oiling which was done during this period consisted of the Dufur-Jefferson County line section of The Dalles-California Highway.

The only new project which has been undertaken in the county is the construction of a new bridge across the Deschutes River at Maupin, the construction of which was begun during the summer of 1928.

All state work in the county, except major bridge construction, during the biennium has been handled under the supervision of C. W. Wanzer, Division Engineer, with headquarters at Bend.

Deschutes River Bridge

Federal Aid Project No. 101-B

On The Dalles-California Highway, at Maupin; one 200-foot steel span with 625 lineal feet of concrete viaduct approach.

Contract No. 1,049, awarded August 14, 1928, to Kuckenberg-Wittman Company, of Portland, Oregon. Work commenced December 10, 1928. Estimated cost, $109,000, being $50,000 from county funds and $67,484.39 from government funds, with a credit of $8,484.39 to state funds. Expenditures to date, $21,044.68 from state funds. Resident Engineer, Frank Moore.

This bridge which crosses the O.-W. R. R. & N. Co. tracks, the Oregon Trunk R. R. tracks and the Deschutes River, replaces an old steel span. It is built on a new location, allowing better grades and alignment of the approaches.

At the end of the biennium all of the concrete for the footings had been poured. It is estimated that the job will be completed in July, 1929.

Wapinitia Forest Road Project

This work was started during the previous biennium and a descriptive article will be found on page 442 of the last report.

The work was handled under the direction of the Bureau of Public Roads and involves two projects, one being the Wapinitia grading and the other the Bear Springs clearing.

The Wapinitia grading was 11.8 miles in length and extended from an intersection with the Market Road between Maupin and Wapinitia, at a point one mile north of Wapinitia, west to the top of Pole Hill. This grading was done under contract awarded to Heller & Company of McMinnville, Oregon. The grading was started in June, 1926, and was completed in November of the same year.

[WASCO]

The Bear Springs grading was 19.6 miles in length and extended from the summit approximately one mile north of Clear Lake to the edge of the timber near Hedins Mill. This clearing was done under a contract awarded to Joplin & Eldon of Portland and was completed in October, 1927.

The total cost of the grading and clearing is estimated at $82,998.33, consisting of $16,998.33 from state funds, $25,000 from county funds and $41,000 from government funds. The expenditures to date have amounted to $78,090.03, of which the state has paid $16,998.33, the county $25,000 and the government $36,091.70.

The state expenditures mentioned include $10,998.33 which was paid by the state direct to Heller & Company for raising the grade over certain portions of the project to a level higher than that called for in the original forest road plans.

Wapinitia, Bear Springs and Summit Forest Road Project

The work on the above section was carried out by the Bureau of Public Roads under one allocation of funds.

The Wapinitia section surfacing covered the surfacing of the section graded under the same name in 1926. The work on this unit was done during the summer of 1927. The construction was handled under contract awarded to the Security Construction Company of La Grande.

The Bear Springs section grading was put under way during 1927 under a contract awarded to F. L. Brown of Boardman. The weather stopped grading operations in September and the project was not completed until October, 1928. During construction, the project was extended approximately 25 per cent of its length, the extension being made for the purpose of reaching a proposed rock quarry.

The Summit section grading was three miles in length and extended east from the end of the finished section at the summit of the Cascade range. This work was placed under contract to Baker & Scharschmidt of Portland who began their operations in July, 1927, and completed them in July, 1928.

The total cost of the three units is $155,000, to be paid $105,000 from state funds and $50,000 from government funds. Expenditures to date have amounted to $135,618.13, of which the state has paid $105,000 and the government the balance of $30,618.13.

Elk Creek Forest Road Grading

This section is the last section of the Wapinitia Highway to be graded. It is 2.3 miles in length and is located between the Summit and Bear Springs sections. A contract for the work was awarded by the Bureau of Public Roads to S. Simonsen of Portland who began grading operations in July, 1928. The contract includes the construction of a concrete bridge over Clear Creek. At the present time work is approximately 75 per cent complete.

The estimated cost of the work is $53,000, to be paid entirely from government funds. Government expenditures to date amount to $32,853.52.

[WASCO]

Maintenance

The Columbia River Highway in Wasco County, between the Hood River County line and a point three miles east of The Dalles, is surfaced with bituminous pavement which has required only the general routine of patching and the maintenance of shoulders, drainage, etc. During the biennium a portable paving plant was made available to repair breaks, widen curves, etc., which work was done by state forces and equipment. The balance of the Columbia River Highway extending to the Deschutes River, being oiled macadam, has required extensive maintenance due to the heavy traffic and soil conditions.

The section of The Dalles-California Highway from Dufur to the Jefferson County line, previous to oiling, was reconstructed by widening and super-elevating curves, widening shoulders, etc. It was treated with oil during the season of 1928.

Contracts have been awarded for the furnishing of materials for use in maintaining the oiled sections of highway in the county. The only remaining section of state highway in Wasco County which remains unoiled is the section of the Sherman Highway. This was not oiled for the reason that before oiling the roadbed should be strengthened by additional surfacing.

All maintenance work in Wasco County has been handled by Resident Maintenance Engineer K. D. Lytle, located at The Dalles.

Dufur-Cow Canyon Maintenance Materials

On The Dalles-California Highway, from Dufur to the head of Cow Canyon.

Contract No. 1,020, awarded November 29, 1927, to J. W. & J. R. Hillstrom, of Marshfield, Oregon. Work commenced March 12, 1928; completed December 6, 1928. Estimated cost, $40,000, from state funds. Expended to date, $18,316.59. Resident Engineer, A. A. Kirkwood.

This work consisted of the furnishing of broken stone maintenance materials for use in connection with maintenance operations on the Dufur-Cow Canyon section of The Dalles-California Highway in Wasco County. The north end of the section is at Mile Post 25.0, or approximately eight miles south of Dufur. The south end of the section is at Mile Post 65.0, approximately two miles north of the junction of The Dalles-California Highway with the Sherman Highway. The major portion of the materials were stock piled at convenient points designated by this department, the balance having been delivered into state trucks at the quarry sites which were located, one at Maupin and one at the McAllister pit, south of Maupin.

The Dalles-Dillon-Dufur Maintenance Materials

On the Columbia River and The Dalles-California Highway.

Contract No. 953, awarded March 3, 1927, to M. Chandler & Company, of The Dalles, Oregon. Work commenced July 11, 1927; completed October 10, 1927. Final cost, $12,752.41. Resident Engineer, K. D. Lytle.

This work consisted of the furnishing of maintenance materials for use in connection with maintenance operation on The Dalles-Dillon section

[WASCO]

of the Columbia River Highway and on The Dalles-Dufur section of The Dalles-California Highway in Wasco County. The major portion of the materials were stock piled at convenient points designated by this department, the balance being delivered into state trucks at the quarry, which was located at the "Petersburg" site.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 723.27
Preparation of stock pile sites		6.14
Contract items as follows:		
Grade "A" crushed gravel in stock piles, 5,427.0 cu. yds. at 65c	$ 3,527.55	
Grade "B" crushed gravel in stock piles, 1,118.4 cu. yds. at 65c	726.96	
Grade "A" crushed gravel in trucks, 2,020.5 cu. yds. at 65c	1,313.33	
Truck haul (pile measurement), 27,402.5 yd. mi. at 20c	5,480.50	
Truck haul (truck measurement), 5,414.8 yd. mi. at 18c	974.66	
Total amount paid to contractor		12,023.00
Grand total cost of project, all state funds, 1927-28		$12,752.41

Memaloose Park Development

The work in the development of this park was completed during the preceding biennium, and a descriptive article may be found on page 447 of the 1925-26 report.

No additional work has been done in improving the park during the past two years, except that a bronze plaque bearing the name of the donors, Roy D. Chatfield and wife, was placed in masonry work.

Expenditures on the project during the past two years have amounted to $36.67.

Mayer Park Development

Work on this project was completed during prior bienniums, and descriptive articles will be found on page 472 of the 1923-24 report and on page 448 of the 1925-26 report.

No additional work has been done during the present biennium except the installation of a bronze plaque bearing the name of the donor, Mark A. Mayer, the date of the donation, etc.

Expenditures during the present biennium have amounted to $40.40 from state funds.

WASHINGTON COUNTY

The only items of state highway construction in Washington County during the years of 1927 and 1928 have been classed as major betterments rather than new construction. A renewal of the Fanno Creek bridge at Tigard and the reconstruction of the Tualatin Valley Highway between the Multnomah County line and Beaverton are the two projects referred to. The Tualatin Valley Highway between the Multnomah County line and Beaverton, on the Canyon Road, as it is locally known, is an extension of that part of the Canyon Road in Multnomah County which has been very radically changed and improved by the county in 1927 and 1928. That improvement of the Multnomah County portion of the road, consisting, as it did, of its transformation into a super highway with a roadbed 57 feet in width and contemplating the future constructon of a 40-foot pavement, practically forced upon the state the improvement of the Washingon County section connecting.

State work in the county has been handled under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem.

Multnomah County Line-Beaverton Grading

On the Tualatin Valley Highway, from Mile Post 4.20 at Sta. minus 1+90.6, at the Multnomah-Washington County line, southwest to Mile Post 7.97, at Sta. 197+00, at the intersection with Cedar street in the town of Beaverton; 3.77 miles of grading, 44-foot standard roadbed and 0.42 mile of broken stone surfacing.

Contract No. 1,030, awarded January 26, 1928, to Edlefson-Weygandt Company, of Portland, Oregon. Work commenced March 1, 1928; completed October 1, 1928. Estimated cost, $80,000. Resident Engineer, F. T. Young.

Reconstruction of the Multnomah County Line-Beaverton section of the Tualatin Valley Highway, which was determined upon in 1927 in order to put the Washington County portion of the Canyon Road entrance to Portland into reasonably comparable condition with the Multnomah County portion, was done under the contract described above. This contract was preceded, however, by the construction of the large cut immediately at the county line and a part of the adjoining fill by Multnomah County in connection with their contract for construction of the section within that county. This work was done on agreement between the county and the state, the county being reimbursed for its cost in the amount of $15,659.02.

All important structures on the project, including reinforced concrete box culverts and the larger pipe culverts have been constructed on the basis of an ultimate 56-foot roadbed designed to carry 40 feet of pavement with an eight-foot shoulder on either side.

A feature of particular interest and of considerable importance in its bearing upon the case and the future attitude of the public and the highway officials regarding the location of highways through cities, is the situation in the city of Beaverton where the highway has been relocated to avoid the main street of the town. This has been done with the cooperation of the city officials and property owners, including some business men, whose present business locations might seem to be adversely affected

[WASHINGTON]

by the change. There was, of course, some opposition and an effort made to bring about the widening and improvement of the existing main street in a way and to an extent which would be necessary to care for the state highway traffic and measure up to the standard improvement being planned for the connecting highways. It is believed, however, that the new location, following a heretofore unimproved street one block distant from the present main street, will eventually prove to have been the wiser selection, transforming the city out of its present "one-street-town" status.

Detailed Statement of Expenditures

Engineering		$ 5,149.39
Labor and materials furnished by state:		
Repairing broken drain tiles		295.26
Constructing flumes for fill slope protection		455.99
Constructing connection between state highway and Multnomah County road		15,905.06
Signs for traffic control		58.83
Sprinkling surfacing		30.00
Repairing pavement in Beaverton at new highway crossing		104.30
Contract items as follows:		
Clearing and grubbing all	$ 350.00	
Extra clearing, 0.138 acres at $150.00	20.70	
Common excavation, 67,585.0 cu. yds. at 33c	22,303.05	
Solid rock excavation, 9,106.0 cu. yds. at $1.00	9,106.00	
Overhaul, 66,307.0 yd. sta. at 3c	1,989.21	
Truck haul, 27,855.0 yd. mi. at 18c	5,013.90	
6-inch porous drain tile, 1,076.0 lin. ft. at 26c	279.76	
12-inch concrete pipe, 933.0 lin. ft. at $1.00	933.00	
18-inch concrete pipe, 453.0 lin. ft. at $2.50	1,132.50	
48-inch concrete pipe, 38.0 lin. ft. at 8.50	323.00	
Class "A" concrete, 200.85 cu. yds. at $20.00	4,017.00	
Class "C" concrete, 13.81 cu. yds. at 19.00	262.39	
Metal reinforcement, 12,865.0 lbs. at 6c	771.90	
Lumber and timber, 19.884 M-FBM at $60.00	1,193.04	
Rock backfill, 28.5 cu. yds. at $2.50	71.25	
Removing old pavement, 899.7 sq. yds. at 80c	719.76	
Base course surfacing, 1,291.0 cu. yds. at $2.50	3,227.50	
Top course surfacing, 812.0 cu. yds. at $2.50	2,030.00	
Structural excavation, 538.0 cu. yds. at $1.50	807.00	
Cement rubble masonry, 61.16 cu. yds. at $9.00	550.44	
8-inch concrete sewer pipe, 660.0 lin. ft. at 45c	297.00	
8-inch concrete wyes, 13 each at $1.80	23.40	
Metal water-stop material, 468.0 lin. ft. at 8½c	39.78	
Force account items:		
Salvaging culvert pipe from old road and replacing at stations 61+60 and 72+00	66.48	
Removing fence account of widening right-of-way	32.83	
Digging, hauling and spreading clay filler and gravel surfacing	78.19	
Repairing private water supply system	140.99	
Removing logs from right of way stations 50 to 54	91.43	
Removing pump-house from right of way station 45+75	68.52	
Cut away concrete wing walls to allow for extension of culvert	83.23	
Total amount earned by contractor	$56,023.25	
Less final estimate in process of payment	4,535.07	
Total amount paid to contractor		51,488.18
Grand total expended on project, 1927-28		$73,487.01

PARTICIPATION IN COST

	State	*County*	*Total*
Expended to date	$68,487.01	$ 5,000.00	$73,487.01
Estimated cost to complete	6,512.99	.....	6,512.99
Total estimated costs	$75,000.00	$ 5,000.00	$80,000.00

[WASHINGTON]

Maintenance

Maintenance work in Washington County during the last two years has consisted exclusively of the routine operations of drainage and roadbed maintenance with no more than a normal amount of pavement repair. In this connection it may be observed that as to the concrete pavement between Hillsboro and Bertha a normal amount may be considered to mean rather more than in the case of other sections of concrete pavement of more modern standard of design. Paving reports have shown that this section has required in the past what might very properly be termed an abnormal amount of repair, but the volume of such work which has been necessary in the past two years has not been excessive when compared with that required for a number of years past, and particularly in view of the character of the pavement and of the traffic to which it is subjected.

Maintenance work in Washington County has been under the field direction of F. D. Eason, Resident Engineer, with headquarters at McMinnville. General supervision of the work has been handled by W. D. Clarke, Division Engineer, with headquarters at Salem.

Sylvan-Beaverton Survey

Survey of relocation in preparation for the reconstruction of the Sylvan-Beaverton (Canyon Road) section of the Tualatin Valley Highway in Washington County which was just being started at the close of the preceding biennium has been completed from the Multnomah County line to the westerly side of the city of Beaverton, a distance of 3.94 miles. For the first one and one-half miles from the county line the survey follows practically a new route away from the existing highway, although crossing it once or twice at either end of that section. For the next one and one-half miles the line is practically along the old highway and then leaves it again near the easterly city limits of Beaverton, passing through the city about a block north of the main street, which the present highway route follows.

This survey was begun November 25, 1926, and completed January 10, 1928. The work was done under the direction of F. D. Eason, Resident Engineer, McMinnville, Oregon.

Tualatin River Survey

In anticipation of the early necessity for rebuilding the Tualatin River bridge on the West Side Pacific Highway, a survey was made of a line revision which would locate the new bridge somewhat further up stream and permit the elimination of the sharp curves at either end of the present bridge. The curve at the southerly end of the present structure is a particularly sharp and dangerous one, especially in wet weather when the black pavement is slick, and the change of line contemplated in the new survey will entirely remove the hazard of that situation.

The survey has been made by F. D. Eason, Resident Engineer, McMinnville, Oregon, at spare times and for that reason the survey with several alternate investigations and modifications has continued over a number of months and is, in fact, subject to further revisions before actual construction of the new bridge shall be begun, which is anticipated for the coming year.

[WASHINGTON]

Sylvan-Beaverton Right-of-Way

On the Tualatin Valley Highway.

Expenditures totaling $34,266.98 have been made during the biennium just closed in the acquisition of right-of-way for the relocated line of the Tualatin Valley Highway. Acquisition of this right-of-way was undertaken by the county court of Washington County at the request of the state and a resolution proceeding was instituted in the spring of 1927. This proceeding was carried through to the point of issuing county warrants in payment of the damages as allowed by the county board of viewers. A large proportion of the property owners accepted these awards and the matter was finished so far as they were concerned. In about a dozen cases, however, the awards were rejected by the owners and appeals filed. In view of the possibility of technical irregularities in the proceedings it was deemed best to abandon further action from the county court proceedings and after failing in the effort to negotiate settlements with the property owners, condemnation suits were filed. These suits have not come to trial by the end of the period covered by this report, but are set for hearing early in 1929.

The original county proceedings covered only the section from the Multnomah County line to the easterly side of Beaverton. Rights-of-way through the city itself have been, or rather are being, since they have not all been acquired, obtained by direct negotiation. In connection with the right-of-way through the city of Beaverton, Washington County is cooperating in the amount of $5,000, beyond which sum the state is paying for the right-of-way for the entire project.

WHEELER COUNTY

During the past biennium the state work in this county has consisted of the grading of the Mitchell-Keys Creek Summit section, 7.48 miles, of the Ochoco Highway and of the maintenance of the improved section of the Ochoco Highway west from Mitchell to the Crook County line, also of maintenance of the John Day Highway through Wheeler County.

The section of 7.48 miles just graded east of Mitchell is the first of five units which remained to be constructed and which will upon their completion finish the Ochoco Highway through to its junction with the John Day Highway at Rock Creek, a section of approximately 1.57 miles of which will be in Grant County. A number of minor betterments have been made, such as widening curves, improving sight distances and taking care of drainage. No oiling work has yet been done in Wheeler County, with the exception of some work done on a cooperative basis in the town of Fossil, which consisted of oiling of the highway through the town, full width, the city paying for all that portion outside of the 18-foot strip of the highway.

All state work in this county has been handled by C. W. Wanzer, Division Engineer, with headquarters at Bend.

Mitchell-Keys Creek Summit Grading

Federal Aid Project No. 134-A

On the Ochoco Highway, from Sta. 1+00, which station is at the west end of the bridge over Bridge Creek in the town of Mitchell, to Sta. 396+50 which station is just east of the summit of the long grade east of Mitchell; 7.48 miles of grading.

Contract No. 1,002, awarded September 27, 1927, to F. L. Brown, of Portland, Oregon. Work commenced November 1, 1927. Estimated cost, $86,000, being $23,856.20 from state funds, $15,000 from county funds and $47,143.80 from government funds. Expenditures to date, $68,656.25, being $26,890.41 from state funds, $5,000 from county funds and $36,765.84 from government funds. Resident Engineer, J. E. Peck.

This work has proceeded very satisfactorily and is practically completed at this time. However, the final estimate and costs are not yet at hand. This is the first of five units left of the Ochoco Highway to be constructed and serves as an outlet to farmers living in the vicinity. The work has been performed in the most part by a power shovel and light dump trucks.

Maintenance

The maintenance work within this county has been handled by regular patrol crews stationed at convenient points. All of the improved sections of the John Day Highway are surfaced with broken stone macadam, with the exception of the section from Service Creek to Fossil. This is unsurfaced but has the peculiar advantage of being a "natural" surfacing material characteristic to that vicinity which has held up very satisfactorily in its natural state without additional surfacing material having been added.

[WHEELER]

The section of the Ochoco Highway which has been improved has a macadam surfacing. This has been maintained very satisfactorily with light equipment and has not had to be resurfaced during the past biennium.

The Ochoco Highway which traverses the Ochoco Mountains, the summit of which is 5,289 feet in elevation, has been kept open during the winter months, mostly by the use of teams and graders and without interruption to traffic.

The work in the county has been handled by Resident Maintenance Engineer J. R. Mitchell, located at Condon, with the exception of the Ochoco Highway which has been handled by Resident Maintenance Engineer W. S. Hodge, located at Redmond.

Shelton Park

On the John Day Highway between Fossil and Service Creek.

The only expense in connection with this park during 1927-1928 was an attempt to enlarge the premises by acquiring from the Kenzua Lumber Company a tract of land adjacent to the existing park. This additional tract was covered with a valuable stand of pine timber and was cruised at the expense of the state to determine its value. To date nothing definite has been determined other than to complete the cruise of the timber, and submit the same to the Timber Company.

Some work was done on the fountain and ovens built for campers' use.

Further details will be found on page 456 of the 1925-26 report.

Mitchell-Dayville Survey

This is a resurvey of the portion of the Ochoco Highway beginning at Keyes Creek Summit and extending easterly to the John Day Highway at Rock Creek.

The original survey was made along the lines that were standard at that time, but are not adaptable to the high standard now being used by the State Highway Department.

Considerable time was expended on the reconnaissance, there being some pressure to reroute the line via Ontario instead of Mountain Creek. After making a thorough investigation the line via Mountain Creek was adopted and the location made on that route. Owing to the rough character of the country traversed, it was necessary to run some preliminary lines for projection, the prior survey data being used wherever possible.

YAMHILL COUNTY

The biennial report for 1925-1926 recorded the final completion during that biennium of the last remaining section of the state highway system in Yamhill County. There has, therefore, been no opportunity for new construction work during the succeeding two years and no major betterment work in the way of reconstruction has been undertaken during the period, although several projects for betterment work, particularly in connection with realignments, and in the vicinity of bridges which are to be rebuilt, are being planned for the near future.

State work in the county has been handled under the supervision of W. D. Clarke, Division Engineer, with headquarters at Salem, Oregon.

St. Joseph Section Paving

Federal Aid Project No. 122

On the West Side Pacific Highway, from the end of the constructed pavement at St. Joseph station, which station is about three miles north and east of McMinnville, south and west to a point 360 feet south of the south end of the bridge over the North Yamhill River; 1.19 miles of concrete pavement, 18 feet wide, seven inches thick at the center, and nine inches thick at the outer edges; the extra thickness being obtained in the last three feet on both edges. Gravel shoulders three feet wide on both sides.

Contract No. 787, awarded March 27, 1925, to the Oregon Contract Company, of Portland, Oregon. Work commenced May 21, 1925; completed September 25, 1925. Final cost, $38,534.04. Resident Engineer, F. D. Eason.

Further details will be found on page 458 of the 1925-26 report.

DETAILED STATEMENT OF EXPENDITURES

Engineering		$ 2,202.67
Items deducted from the contractor's estimate:		
Asphalt for filling center joint of new pavement		28.00
Labor and materials furnished by the state:		
Constructing standard wood guard fence		1,103.87
Rental of roller for rolling shoulders		15.50
Patching small cracks in pavement		44.72
Signs for control of traffic		4.00
Installing drainage flumes and tile drains		208.88
Contract items as follows:		
Excavation, 87.0 cu. yds at 70c	$ 60.90	
Preparation of subgrade, 14,724.0 sq. yds at 6c	883.44	
Portland cement concrete pavement, 13,237.49 sq. yds. at $2.30	30,446.23	
Extra width 9-inch pavement, 86.41 sq. yds. at $2.82	243.68	
Constructing pavement in two strips, 2,522.0 sq. yds. at 10c	252.20	
Expansion joints, 5,006.5 lin. ft. at 14c	700.91	
Longitudinal joints, 3,951.0 lin. ft. at 16c	632.16	
Steel tie bars, 3,954.0 lbs at 7c	276.78	
Crushed gravel shoulders, 562.0 cu. yds. at $2.50	1,405.00	
Concrete curb, 177.0 lin. ft. at 30c	53.10	
Total amount earned by contractor	$34,954.40	
Deduction for asphalt furnished by state	28.00	
Total amount paid to contractor		34,926.40
Grand total cost of project		$38,534.04

PARTICIPATION IN COST

	State	*Government*	*Total*
Expended 1925-26 biennium	$15,807.93	$22,241.92	$38,049.85
Expended 1927-28 biennium	484.19	.....	484.19
Total of expenditures	$16,292.12	$22.241.92	$38,534.04

[YAMHILL]

Maintenance

As was the case in 1925-1926, the two principal items of maintenance work in Yamhill County during the biennium just closed have been the macadam sections on the McMinnville-Tillamook Highway between Sheridan and Willamina and between Butler's store and Dolph, and the bituminous paved section between Paulus Corners at the junction of the West Side Pacific and the McMinnville-Tillamook Highways and Bellevue.

On the last named section there has been a considerable amount of pavement repair work necessary each year, though somewhat less than was required in 1926 and 1925. In 1928 a section about one and one-half miles, extending southerly or westerly from a point about 1,600 feet from Paulus Corners, was redressed as a comparative experiment with several types of bituminous macadam. Approximately one-third of that distance was covered with a road mix bituminous macadam about one and one-quarter inches thick, using 95 per cent asphaltic oil with crushed gravel for the rock material. On the other two-thirds, three different types of plant-mixed bituminous macadam were placed, the larger part of which was composed of crushed gravel with 95 per cent asphaltic oil at the southwesterly end of the experimental section. However, there were placed two sections of approximately 100 yards each in which the binder material was Grade "D" and "E" asphalt, respectively, instead of the 95 per cent oil. Up to the close of the year there appears no essential difference between these various types of redress surfacing. Each is holding up in good shape and each is giving about the same satisfactory results in the matter of providing a non-skid surface. The plant-mixed sections, however, were given an additional seal coat of Bitumuls subsequent to their original construction, as it was found there seemed to be an excessive openness of the top which it was feared would lead to raveling. The additional seal coat appears to have avoided any such tendency. On the Sheridan-Willamina section there has been constructed a heavy type bituminous macadam surface using 95 per cent asphaltic oil and upon the Butler's store-Dolph section a sample surface treatment of 95 per cent oil, both of which are included in the detailed statement of oiling operations in the general section relating to maintenance in this report.

Other than the operations described above, maintenance work in Yamhill County has been confined to the regular patrol operations of maintenance and drainage and roadbed, repairs to guard fences and signs, minor pavement patching, etc.

Maintenance work in Yamhill County has been under the field direction of F. D. Eason, Resident Engineer, with headquarters at McMinnville. General supervision of the work has been handled by W. D. Clarke, Division Engineer, with headquarters at Salem.

Equipment Quarters at Willamina

On the McMinnville-Tillamook Highway.

Willamina being the end of the Southern Pacific branch line railroad beyond which heavy freight charges are required over the Willamina and Grande Ronde logging railroad, has proved to be an important point for shipments of road material, particularly of oil for oiling of the Sheri-

dan-Grande Ronde section of the McMinnville-Tillamook Highway. In order to be able to make a permanent installation of supply tanks, pumps, etc., in connection with such oiling operations, a maintenance station site consisting of a lot in close proximity to the railroad tracks at Willamina has been purchased. In this connection expenditure of $168 has been made during the biennium just closed.

Grande Ronde-Sheridan Maintenance Materials

On the McMinnville-Tillamook Highway, from Mile Post 17.0, approximately one and two-tenths miles east of Bee Ranch, east to Mile Post 35.89 at the west city limits of Sheridan; the furnishing of 37,835 cubic yards of maintenance materials.

Contract No. 958, awarded March 4, 1927, to the Motor Investment Company, of Portland, Oregon. Work commenced July, 1927; completed September 15, 1928. Estimated cost, $98,000, from state funds. Expenditures to date, $92,791.70. Resident Engineer, G. S. Gray.

In preparation for the future oiling work planned for the McMinnville-Tillamook Highway from Sheridan west through Willamina and Grande Ronde to a point 17 miles east of Hebo, the contract was let in March, 1927, for the furnishing of crushed rock maintenance materials. Bids were taken with the option given the contractor of furnishing the material from the Wirth quarry at Mile Post 25, or from a quarry site designated as the Gold Creek quarry one mile south of the highway on Gold Creek. The low bidder elected to secure the rock from the Gold Creek site and that quarry site was, therefore, acquired upon a 20-year lease. When the contractor opened up the quarry, however, it was found that the material to be secured would not be satisfactory, owing to the presence of a large percentage of soft rock which was impractical to separate from the good rock. For this reason it became necessary to make a modification of the contract which provided for moving the contractor's operations to the Wirth quarry. This arrangement was effected on the basis of the state paying for the cost of moving the contractor's plant and equipment from the Gold Creek quarry to the Wirth quarry and payment of an additional amount per cubic yard for the material furnished to cover the extra expense of quarrying the material at the Wirth quarry, the Wirth quarry being a so-called "Swede" quarry, while that at Gold Creek would have been a drag line operation. This change necessarily delayed the completion of the contract materially and the amount of rock ultimately furnished has been increased approximately 17 per cent over that originally required due to the fact that a much larger proportion of the rock was necessary for use during the contract operations and prior to the commencement of oiling operations for immediate application to the road than was anticipated and for the further reason that the plans for the oiling operations themselves were changed so that a larger amount of material was necessary. In addition to the rock required for the maintenance and oiling operations there was also furnished under this contract an amount of 3,000 cubic yards for use in connection with the surfacing of the Valley Junction section, where the highway was reconstructed in connection with the new Yamhill River bridge. Of the 37,835 cubic yards of crushed rock material furnished for maintenance and oiling under the

[YAMHILL]

contract, approximately 10,000 cubic yards were used for building up the macadam surfacing in sufficient quantities as to constitute a practical resurfacing of the highway over the section involved and extending from Mile Post 17 on the McMinnville-Tillamook Highway to Mile Post 25, a distance of eight miles.

Detailed Statement of Expenditures

Engineering		$ 3,075.23
Lease of quarry sites		1,260.00
Lease of stock pile sites		147.92
Preparation of stock pile sites		1,644.48
State-owned equipment furnished contractor by special agreement		870.00
Constructing surfacing by state forces		246.03
Hauling and stock piling maintenance materials by state forces		693.23
Purchasing and placing crushed gravel on Sheridan-Willamina section		12,747.08
Labor and materials furnished by state deducted from contractor's estimate		476.74
Credit for materials stock piled for betterment work	Cr.	26,164.40
Contract items as follows:		
Gold Creek Quarry		
Truck haul, 1,643.0 yd. mi. at 18c	$ 295.74	
Grade "E" materials in stock pile, 285.2 cu. yds. at $2.44	695.89	
Grade "A" materials in trucks, 128.0 cu. yds. at $1.50	192.00	
Grade "B" materials in trucks, 97.5 cu. yds. at $1.40	136.50	
Grade "D" materials in trucks, 192.0 cu. yds. at $1.30	249.60	
Wirth Quarry		
Truck haul, 62,127.0 yd. mi. at 18c	$ 11,182.86	
Grade "A" materials in stock pile, 3,497.1 cu. yds. at $3.41	11,925.11	
Grade "B" materials in stock pile, 3,244.0 cu. yds. at $3.31	10,737.64	
Grade "C" materials in stock pile, 1,830.6 cu. yds. at $3.59	6,571.85	
Grade "D" materials in stock pile, 8,522.6 cu. yds. at $3.09	26,334.83	
Grade "E" materials in stock pile, 576.9 cu. yds. at $3.09	1,782.62	
1½-inch to 3-inch materials in stock pile, 1,701.7 cu. yds. at $3.09	5,258.25	
Grade "A" materials in trucks, 68.0 cu. yds. at $2.15	146.20	
Grade "B" materials in trucks, 626.5 cu. yds. at $2.05	1,284.32	
Grade "C" materials in trucks, 336.0 cu. yds. at $2.05	688.80	
Grade "D" materials in trucks, 9,680.5 cu. yds. at $1.95	18,876.98	
Grade "E" materials in trucks, 5,549.5 cu. yds. at $1.95	10,821.53	
3-inch material in trucks, 24.0 cu. yds. at $1.95	46.80	
Stock piling at quarry, 2,724.9 cu. yds. at 4½c	122.62	
Force account items:		
Testing for surfacing materials	269.35	
Driving and shooting coyote tunnel at Gold Creek quarry	2,986.72	
Transferring crushing plant from Gold Creek quarry to Wirth quarry	3,297.43	
Total amount earned by contractor	$113,903.64	
Deductions:		
Haul adjustment	11,625.08	
Labor and materials furnished by state	476.74	
Final estimate in transit	4,006.43	
Total amount paid to contractor		97,795.39
Grand total expended on project, all state funds, 1927-28		$ 92,791.70

DETAIL OF BETTERMENT ITEMS TRANSFERRED

1½-inch to ¾-inch maintenance materials, 5,230.0 cu. yds. at $3.09	$ 16,160.70
¾-inch to ½-inch maintenance materials, 940.0 cu. yds. at $3.31	3,111.40
½-inch to ⅛-inch maintenance materials, 1,030.0 cu. yds. at $3.41	3,512.30
Grade "A" maintenance materials, 250.0 cu. yds. at $2.60	650.00
Grade "B" maintenance materials, 200.0 cu. yds. at $2.60	520.00
Grade "C" maintenance materials, 350.0 cu. yds. at $2.60	910.00
Grade "E" maintenance materials, 500.0 cu. yds. at $2.60	1,300.00
Total	$ 26,164.40

[YAMHILL]

Sheridan-Willamina Survey

Prior to the construction of the bituminous macadam surface which has been placed on the Sheridan-Willamina section during 1928, the question of paving that section has been agitated on a number of occasions and because it has seemed highly desirable to consider also the question of a relocation of the section to avoid the two railroad grade crossings which now exist within its limits at the time consideration was given to paving of the section, a survey was made of the section to investigate the possibilities of a relocation. Several alternate lines were run and a complete study of the situation was made. With the construction of the bituminous macadam surface on that section, however, there appears little possibility that any revision will be made in the near future.

This survey extended from the west city limits of Sheridan to the end of the concrete pavement at D street in Willamina, a distance of 4.15 miles, and was made between December 1, 1927, and February 4, 1928, under the direction of F. D. Eason, Resident Engineer, McMinnville, Oregon.

PART SIX

Description of Work Accomplished by Counties under the Market Road Act 1920-1928

BAKER COUNTY

Since the beginning in 1920 a total of $680,589.96 has been made available for market roads in Baker county, of which $286,748.21 was from the state market road appropriation, $282,617.83 from county market road levies, and approximately $111,223.92 from cooperative funds as bonds, general funds, etc. Of this total $662,229.01 has been expended and the following work accomplished: 55.09 miles graded; 51.09 miles surfaced; cooperation to the extent of $13,500 on the interstate bridge at Homestead; maintenance during the last four years costing $19,839.71 and cooperation on state highway construction to the extent of $111,519.

During the last two years $172,225.05 has been spent and the following accomplished: 14.41 miles graded; 16.91 miles surfaced; maintenance costing $12,878.03; and cooperation on state highway construction to the extent of $69,189.

The two-year period just ending witnessed the completion of the Baker-Medical Springs, the Wingville and the Richland-New Bridge market roads; the Timber Canyon section, the last gap in the highway between Baker and Halfway. These roads complete a system of highway and market roads which provide the county with a network of all-year roads connecting the sections of the county and making each more accessible to the other. Market road maintenance has been organized on a patrol basis and has provided good maintenance at a reasonable cost.

All market road construction has been done by contract with engineering by W. C. Williams, Resident Engineer, and J. N. Bishop, Resident Engineer, both State Highway Department men. The Baker County court consisted of Judge Chas. E. Baird, County Commissioners D. M. Cartmill and J. E. McKinnon.

[BAKER]

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Name and Number	Length in Miles	Classification As to Improvement		
		Surfaced With Rock or Gravel	Graded to Market Road Standard	Not Graded to Market Road Standard
1. Muddy Creek	4.32	4.32	.....	.....
2. North Powder-Muddy Creek	4.37	4.37	.....	.....
3. Sumpter Valley	14.00	7.92	.....	6.08
4. Robinette	4.13	4.13	.....	.....
5. Bridgeport	6.00	.....	.....	6.00
6. Baker-Cornucopia Highway	.....	.....	.....	.....
7. Haines-Rock Creek	2.97	2.97	.....	.....
8. Baker-James School	7.00	3.74	.....	3.26
9. Lower Pine Creek	30.00	.....	.....	30.00
10. Medical Springs	21.00	21.00	.....	.....
11. Richland-Newbridge	2.40	2.40	.....	.....
12. Wingville	2.01	2.01	.....	.....
13. Rye Valley	8.50	.....	.....	8.50
Total	106.70	52.86	.....	53.84

Sumpter Valley Market Road No. 3

Widening first curve west of Lockhart, 400 feet in length. Work done in August and September, 1928, by county forces at a cost of $765.76, market road funds.

Baker-Cornucopia Highway—Also Market Road No. 6

Timber Canyon section, 3.55 miles, grading and cushioning, Sta. 0 to Sta. 183+60. Work by H. E. Cornell, contractor; begun September, 1926; completed July, 1927. Cost $87,880.43. Market road funds, $82,-330.43; state funds for engineering, $5,550. Cushion consisted of two inches of earth covered with five inches of talus material, which makes a good, cheap surface.

Baker-Medical Springs Market Road No. 10

Miles Bridge to county line section, grading 5.95 miles, Sta. 0, at Miles Bridge, 15 miles northeast of Baker, to Sta. 319+30, at the Baker-Union County line; roadbed width 20 feet. Work by H. C. Boyer, contractor; begun June 15, 1927; completed November 22, 1927. Cost, $31,474.33, market road funds.

Miles Bridge to county line section, surfacing 5.95 miles, Sta. 0 to Sta. 319+30. Surface 14 feet wide, 8 inches deep; crushed rock one and one-half inch minus base and three-quarter inch minus top. Work by Security Construction Company, contractor; Knute Lien, subcontractor; and the Metropolitan Casualty Insurance Company of New York, bondsmen. Work begun December, 1927; completed April, 1928. Cost, $24,063.57, market road funds. Base course was completed so that use of the road was made possible through the winter and spring of 1928.

Missouri Flat section, three miles regrading and resurfacing. This section extends from the end of the Baker-Missouri Flat section, which was graded and surfaced in 1926, to the foot of the hill, or the beginning of the Missouri Flat-Miles Bridge section, graded and surfaced in 1924-1925. The old road consisted of a fair grade which was widened by county forces with county caterpillar and grader in 1927. Some surfacing

material was hauled in 1927 from stock piles on the Missouri Flat-Miles Bridge section. Some surfacing was hauled in 1928 from the Miles Bridge-County line section. The cost of the work was not segregated from the maintenance or construction costs. It is estimated $500 was spent from the maintenance fund.

Richland-Newbridge Market Road No. 11

Grading 2.40 miles, Sta. 0+00 at junction with highway, to Sta. 126+50 at Newbridge. Roadbed width, 20 feet. Work by E. C. Enebeck, contractor; begun April, 1928; completed July, 1928. Cost, $8,037.88, all market road funds.

Surfacing 2.40 miles, Sta. 0+00 at junction with highway, to Sta. 126+50 at Newbridge. Surface 14 feet wide, 8 inches deep; crushed gravel one and one-fourth inches minus base and top. Work by Knute Lien, contractor; begun July, 1928; completed September, 1928. Cost, $6,452.78, all market road funds.

Wingville Market Road No. 12

Grading 2.01 miles, Sta. 0, at Wingville, to Sta. 106+30, at Junction with highway. Roadbed width, 20 feet. Work by H. C. Boyer, contractor; begun September, 1927; completed April 25, 1928. Cost, $7,083.19, market road funds.

Surfacing 2.01 miles, Sta. 0 to Sta. 106+30. Surface 14 feet wide, 8 inches deep, pit run gravel. Work by W. W. Lloyd, contractor; begun November 18, 1927; completed May 23, 1928. Cost, $4,612.15, market road funds.

BENTON COUNTY

Since the beginning in 1920 a total of $379,141.65 has been made available for market roads in Benton county, of which $181,826.06 was from the state market road appropriation, $179,169.13 from county market road levies, and approximately $18,146.46 from cooperative funds such as bonds, motor license funds, O. & C. funds, general funds, etc. Of this amount $367,101.21 has been expended and the following work accomplished: 29.18 miles graded, 29.29 miles surfaced, maintenance during the last four years costing $7,389.21, and cooperation on state highway construction to the extent of $130,510.

During the last two years $93,981.42 has been spent and the following accomplished: 8.33 miles graded, 16.75 miles surfaced, maintenance work costing $6,106.05, and cooperation on state highway construction to the extent of $18,266.

Benton County has practically completed the market road system laid out in 1925, and early in 1929 the court plans to designate additional mileage. The Summit road was finished in 1927 and the Albany North road in 1928. The county is very fortunate in the location of the state highways, and though its market road mileage is one of the shortest in the state the bulk of the population is served by the two systems.

Surfacing has been done by contract at very reasonable prices and grading by contract and county force. All engineering work has been handled by County Engineer W. C. Galloway under the direction of County Judge Victor P. Moses and County Commissioners R. C. Von Lehe and A. W. Hawley.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Surfaced with Rock or Gravel
1. Blodgett-Devitt-Summit and north	9.10	9.10
2. Wren-Alder	3.50	3.50
3. Alpine	3.64	3.64
4. Philomath south	2.79	2.79
5. North Albany-Wells	6.10	6.10
6. Kings Valley	10.00	10.00
Total	35.13	35.13

Blodgett-Summit and North Market Road No. 1

Devitt-Summit section, grading, 2.60 miles Sta. 133, at Devitt, to Sta. 271, at Summit. Roadbed width 20 and 24 feet with small span timber bridges, totaling 117 lineal feet. Work by county forces; begun May, 1926, completed July, 1927. Cost, $20,448.57, market road funds. Expended in 1926, $17,308.32, and in 1927, $3,140.25.

Blodgett-Summit section, surfacing 5.13 miles, Sta. 0, at Blodgett, to Sta. 271, at Summit, was graded in 1925 and 1926. Surface 14 feet wide, six inches deep, crushed gravel one and one-half inch base and three-quarter inch top, shipped from Granger and Albany. Work by J. C. Compton, contractor; begun August, 1927, completed October, 1927. Cost, $21,416.65, market road funds. Southern Pacific Railroad company cooperated by allowing special freight rates on surfacing material.

[BENTON]

Summit-North section grading and surfacing four miles, Sta. 257, near Summit, to Sta. 476, four miles north of Summit. Roadbed width, 20 feet; stock passes at Sta. 282 and Sta. 316. Surface eight feet wide and six inches deep, crushed gravel, one and one-half inch base course, three-quarter inch top course; grading by county forces. Surfacing work by J. C. Compton, contractor; completed October 18, 1927. Cost, $15,-321.61, market road funds. Southern Pacific Railroad company cooperated by allowing special freight rates on surfacing material.

Wren-Alder Market Road No. 2

Two short sections, grading 0.23 mile, Sta. 125 to Sta. 130, at the railroad crossing near Harris, and Sta. 178, about one mile west of Harris, to Sta. 185. Roadbed width, 20 to 24 feet. Work by county forces; begun September 3, 1927, completed September 22, 1927. Cost $1,026.34, market road funds.

Wren-Alder, surfacing 3.5 miles, Sta. 0, at Wren, to Sta. 185, one mile west of Harris. Surface eight feet wide, six inches deep, crushed gravel, one and one-half inch base and one-inch top. Work by A. S. Wallace, contractor; begun August, 1927, completed September, 1927. Cost, $6,704.29, market road funds.

North Albany Market Road No. 5

Grading and surfacing 4.10 miles, Sta. 14 to Sta. 45, and Sta. 71+50 to Sta. 263+50. Sta. 0 is at junction with highway. Roadbed width, 22 and 24 feet; one 45-foot piling bridge. Surface 16 feet wide, six inches deep, crushed gravel, one and one-half inch base, one-inch top, furnished by Albany Sand and Gravel company. Grading by Frank M. Bullis, contractor; surfacing by C. H. Hoyt, contractor. Bridge culverts, clearing and grubbing were done by county forces. Work begun February, 1928, completed October, 1928, at a cost of $20,996.09, market road funds.

CLACKAMAS COUNTY

Since the beginning in 1920 a total of $2,212,727.97 has been made available for market roads in Clackamas county, of which $518,767.50 was from the state market road appropriation, $515,818.84 from county market road levies, and approximately $1,178,141.63 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. A total of $2,228,140.74 has been expended and the following work accomplished: 179.68 miles graded, 84.54 miles surfaced, 120.92 miles paved; maintenance during the last four years costing $43,492.55 and cooperation on state highway construction to the extent of $8,045.

During the last two years $497,807.72 has been spent and 25.05 miles graded, 20.18 miles surfaced, 9.73 miles paved, and maintenance costing $32,749.62 performed.

About 1919 Clackamas County voted a bond issue of $11,000 per mile for paving certain roads, which included the more important roads of the county. Practically all of this bond system of roads is included in the present market road system. As the bond allotment per mile is hardly sufficient for pavement, other funds had to be used for bridges, grading, rocking, etc. These consisted of market road, district specials, general road funds, motor vehicle, etc. At this time all of the bond funds for paving have been used except on the Damascus-Boring section of No. 16. Paving has been laid at Oswego, on the Abernathy, Molalla-Wilhoit, Oregon City-Clarks and several small gaps left for fill settlement. As the bond fund is exhausted and only current funds are available, paving seems out of reach, so a start has been made in oiling macadam. To date this has been principally light oil. It is expected in 1929 to carry on a considerable program, using heavy asphalt oils.

In explanation of the great number of small projects, the court has adopted the plan of matching any special tax voted by the districts. These sums range from about $300 up and are usually for a definite object, such as filling a bridge or cutting down a hill. While some of these units are short, they run into quite a sum of money. These units are a part of the system and are all carefully located and properly constructed.

The court has followed out the plan of replacing one of the larger bridges each year. In 1927 Milk River Bridge on Market Road No. 25 was relocated and replaced, and in 1928 Wright's Bridge on the same road was replaced. Plans have not been announced for 1929, but there are several large bridges which are in urgent need of renewal.

Considerable work has been done in building macadam shoulders along the nine-foot concrete pavement. When the pavement was laid it was not always possible to finance this work, but it is fairly well caught up now. Several experimental sections of these shoulders have been oiled with a view of giving a double-track pavement advantage.

Maintenance has shown a big improvement. More equipment has been acquired and the work centralized under the patrol system under the county engineer and the roadmaster. Considerable development in maintenance is still needed, but a big improvement has been made. The local road district supervisor with inadequate equipment has been eliminated from market road maintenance.

[CLACKAMAS]

The program of the past two years has been principally closing up gaps in various projects and now the system of market roads, in a fairly well completed stage, reaches to all parts of the county and the program from now on will be principally in extensions. Many of these roads carry a very heavy traffic, especially on Sundays and holidays.

Concrete pavement construction has always been contracted. With a few exceptions all other work has been done by county forces. Even most of the bridge work is done by county forces. The greatest difficulty is in surfacing, as the units are small in many cases and nearly all quarries are hard-worked quarries.

The work is handled by the County Court, C. W. Kruse, Judge, and R. A. Wright and W. A. Proctor, Commissioners. D. T. Meldrum is County Engineer and Abe Gilbert is Roadmaster.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement				
		Paved with Bituminous Pavement	Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Swede Stump-Meadow Brook	8.50	.....	.....	8.50	.....	.....
2. Estacada-Firwood	7.50	.....	.....	7.50	.....	.....
3. Eagle Creek-Dover	6.00	.....	.....	6.00	.....	.....
4. Borland Road	3.00	.....	.....	3.00	.....	.....
5. Silverton Road	10.25	.....	.....	6.25	3.00	1.00
6. Wilsonville-Ladd Hill	5.50	.....	.....	3.50	0.50	1.50
7. Barton-Carver	5.00	5.00	.....	.....	.....	.....
8. Redland Store-Fisher Mill-Logan	3.75	.....	.....	2.75	0.50	0.50
9. Monitor-Barlow	11.00	5.00	6.00	.....	.....	.....
10. Marquam-Canby	12.75	.....	11.75	.....	.....	1.00
11. Oregon City-Clarks	16.00	.....	9.50	1.00	1.00	4.50
12. Oswego-Wilsonville	11.00	.....	11.00	.....	.....	.....
13. County Line-Lake View Villa	3.25	2.00	.....	.....	0.25	1.00
14. Willamette-Teideman Hill	3.00	.....	3.00	.....	.....	.....
15. Sandy-Pleasant Home	6.25	.....	.....	6.25	.....	.....
16. Rock Creek Bridge-Mt. Hood Loop	13.00	7.00	2.00	4.00	.....	.....
17. Boring-County Line	2.00	.....	1.00	.....	1.00	.....
18. Damascus-County Line	3.25	3.25	.....	.....	.....	.....
19. Barton-Eagle Creek-Estacada	8.25	8.25	.....	.....	.....	.....
20. Oregon City-Viola	12.50	1.50	6.75	1.00	1.00	2.25
21. Myers-Beeson	5.75	.....	.....	4.00	1.75	.....
22. Oregon City-Mulino	8.50	.....	6.00	2.50	.....	.....
23. South End Road	4.00	.....	2.00	2.00	.....	.....
24. Oregon City-Browns School	4.00	.....	2.50	.....	1.00	0.50
25. O'Neill's Corner-Molalla-Wilhoit	19.50	.....	7.50	3.50	2.50	6.00
26. Gribble Prairie-Macksburg-Liberal	0.75	.....	0.75	.....	.....	.....
27. Boone's Ferry-County Line	5.25	.....	0.50	2.25	2.00	0.50
28. Parkplace-Springwater	18.50	17.00	.....	.....	1.50	.....
29. Happy Valley-County Line	2.25	1.50	.....	.....	.....	0.75
30. Boring-Sycamore	5.00	.....	.....	.....	1.00	4.00
31. Oswego-County Line	4.00	.....	0.50	1.25	2.25	.....
32. Molalla-Hubbard	13.00	.....	.....	4.00	4.00	5.00
33. Sandy-Eagle Creek	5.75	.....	.....	1.50	1.00	3.25
34. Oatfield Road	5.00	4.50	.....	.....	.....	0.50
35. Estacada-Colton	11.50	.....	.....	.....	1.00	10.50
36. Lower Highland Road	9.00	.....	.....	0.75	4.00	4.25
37. River Road	7.50	7.50	.....	.....	.....	.....
38. 82nd Street Road	6.00	6.00	.....	.....	.....	.....
39. Rock Creek Bridge to Redland Store	3.25	.....	.....	.....	1.25	2.00
40. Eagle Creek Falls Road	3.50	.....	.....	.....	.....	3.50
Total	293.75	68.50	70.75	71.50	30.50	52.50

[CLACKAMAS]

Swede Stump-Meadowbrook Market Road No. 1

A bridge at Sta. 47+50 was redecked by county forces in 1927 at a cost of $416.11, market road funds.

Light resurface 8.66 miles, Sta. 0+00 to Sta. 459, at Colton. Roadbed width, 24 feet; surface, 16 feet wide. Work by county forces; begun June, 1928, completed July, 1928. Cost, $1,171.82, market road funds.

Estacada-Firwood Market Road No. 2

Unit No. 2, resurface 0.50 mile, Sta. 0 to Sta. 28. Roadbed width, 24 feet; surface, 16 feet wide, three inches deep. Work by county forces in 1927. Total cost, $1,339.13, market road funds.

Estacada-Dover section, paving 0.61 mile, Sta. 15+83 to Sta. 48+00. Bridge at Eagle Creek and survey of entire route. Roadbed width, 24 feet; concrete pavement, nine feet wide, seven inches deep, with thickened edges and nine-foot macadam shoulders. Work by Rigdon Brothers, contractors, in 1928. Total cost, $13,115.36: Market road funds, $6,115.36; district funds, $1,500; O. & C. funds, $5,500.

Silverton Market Road No. 5

Grading and surfacing 1.06 miles, Sta. 50, one mile south of Liberal, to Sta. 106. Roadbed width, 32 feet; surface, 18 feet wide, six inches deep. Surfacing work by Riddings and Wooster, contractors; grading by county forces. Work begun June, 1927; completed December, 1927. Total cost, $11,165.55, market road funds.

Grade and surface 1.34 miles, Sta. 192, 3.5 miles south of Liberal, to Sta. 263. Roadbed width, 32 feet; surface 18 feet wide, six inches deep. Work by county forces in 1927. Total cost, $10,983.28, market road funds.

Bridge over Garrott Creek, Sta. 380 to Sta. 383, also some resurface where needed, Sta. 50 to Sta. 400. Roadbed width, 30 feet. Work by county forces in 1928. Total cost, $2,031.50, market road funds.

Wilsonville-Ladd Hill Market Road No. 6

Grade and surface 0.40 mile Sta. 81, four miles south of Wilsonville, to Sta. 102. Roadbed width, 30 feet; surface 18 feet wide, 8 inches deep. Grade by Earl McNutt, contractor; surfacing by county forces. Work begun April, 1927; completed October, 1927. Total cost, $8,570.43, market road funds.

Carver-Barton Market Road No. 7

Serious slides have occurred near Sta. 55. In 1927, $3,183.91 was spent in removing slides, replacing and riprapping fills and repairing pavement. Early in 1928 slides again came onto the road, so the matter of drainage of the hillside was looked into carefully and a system of drain tile put in at a cost of $2,299.10. Total expenditure for 1928 for removing slides and the drainage system was $3,800.91. Entire cost for both years paid from market road funds. Also in 1927 from Sta. 65 to Sta. 135, $2,121.77 of market road funds was spent in removing slides, widening fills and placing additional culverts.

[CLACKAMAS]

Redland-Fisher Mill-Logan Market Road No. 8

Clear Creek section, grade and surface 0.38 mile, Sta. 141+50, three miles east of Redland store, to Sta. 161+50. Roadbed width, 32 feet. Base surface 10 feet wide, six inches deep. Work by county forces; begun June, 1928, completed September, 1928. Total cost, $811.64, market road funds.

Monitor-Barlow Market Road No. 9

Rock Creek section about 6.6 miles south of Barlow at Sta. 202, a bridge was redecked by county forces in 1927. Cost, $468.49, market road funds.

Paving 0.29 mile. Paving two gaps where original pavement was not put in account of settling fills, Sta. 345+50 to 355+50 and 513 to 518+50. Roadbed width, 30 feet; paved surface, nine feet wide, seven inches deep and nine-foot macadam shoulders. Work by Rigdon Brothers, contractors; county forces grading. Work begun September, 1928; completed September, 1928. Total cost, $4,923.91, market road funds.

Marquam-Canby Market Road No. 10

Sta. 654 to Sta. 250 additional rock on shoulders and turnouts where no shoulder has been placed. Work by county forces; completed in 1928. Total cost, $1,923.82: Market road funds, $1,654.23; district funds, $269.59.

One and twenty-three hundredths miles of macadam shoulder construction, Sta. 654 to Sta. 719 (in Canby at Pacific Highway intersection). Surface seven feet wide, eight inches deep alongside nine-foot concrete pavement put down in 1925 and 1926. Work by county forces; completed 1927. Total cost, $3,200.74, market road funds.

Oregon City-Clarks Market Road No. 11

Clark's Store north toward Oregon City section, 3.36 miles grading, surfacing and concrete pavement, Sta. 0-41 graded; Sta. 256-274 cleared and graded; Sta. 436-477+50 and 54+22-132+04, graded and paved. (0+00 at Clark's Store and 0+00 of 436-477 section at market road No. 22 junction at Oregon City.) Roadbed width, 32 feet; paved surface, nine feet wide, seven inches deep, eight-foot macadam shoulder at one side. Macadam surface 16 feet wide, eight inches deep. Paving done by S. Simonsen, contractor; grading by county forces. Work begun April, 1928; completed November, 1928. Total cost, $37,550.91: Market road funds, $12,894.02; district funds, $2,656.89; bond fund, $22,000. This completes paving on Market Road No. 11 to a point one mile north of Clark's Store from Oregon City. Sta. 274 is at the east end of Market Road No. 11, where it intersects Market Road No. 35, and this unit extends west towards Clark's to Sta. 256. Section Sta. 0 to 41 extends east from Clark's Store.

Grading 0.57 mile, beginning 0+00 at Clark's Store and extending toward Oregon City to Sta. 30+00. Roadbed width, 30 feet. Work by county forces; completed in 1927. Total cost, $1,928.31, market road funds.

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Ten o'Clock Church Hill section, 2.0 miles of concrete pavement and macadam shoulder, Sta. 36+50 to Sta. 40 and Sta. 332 to Sta. 435. Roadbed width, 30 feet; paved surface, nine feet wide, seven inches deep and eight-foot macadam shoulders. Paving work by Hopkins, contractor; county forces on shoulder and grading. Work begun June, 1927; completed October, 1927. Total cost, $32,805.84: Market road funds, $12,805.84; bond funds, $22,000.

Oswego-Wilsonville Market Road No. 12

Sharp Hill section, 1.32 miles of shoulder macadam, Sta. 111+65 to Sta. 181+72, placing eight-foot gravel shoulder alongside nine-foot concrete pavement. Shoulder surface eight feet wide, eight inches deep. Work by county forces; begun April, 1927; completed October, 1927. Total cost, $1,894.38, market road funds.

On Unit No. 4, two miles north of Wilsonville, 0.04 mile paving, Sta. 98+75 to Sta. 100+75. Paved surface nine feet wide, seven inches deep. Work by Rigdon Brothers, contractors; begun October, 1928; completed October, 1928. Total cost, $1,076.79, market road funds. Gap left while fill settled. This completes paving on Market Road No. 12, except 600-foot gap at Tualatin River Bridge.

County Line-Lakeview Villa Market Road No. 13

Grading and surfacing 0.43 mile, Sta. 111+50 (0+00 at end of pavement) to Sta. 134+00 at the Washington County line. Roadbed width, 32 feet; surface 18 feet wide, eight inches deep. Work by county forces; begun August, 1928; completed October, 1928. Total cost, $2,730.03: Market road funds, $1,662.13; district funds, $1,067.90.

Intersection Market Road No. 31, south to county line. Survey only in 1927. Cost $145.98, market road funds.

Sandy-Pleasant Home (Bluff Road) Market Road No. 15

Resurfacing 6.31 miles, Sta. 0+00, at Multnomah County line, to Sta. 333+63, at Sandy. Resurface only preparatory to oiling in 1929. Surface 16 feet wide, four inches deep. Work by county forces; begun August, 1928; completed September, 1928. Cost $3,423.32, market road funds.

Rock Creek Bridge-Mt. Hood Loop Market Road No. 16

Damascus-Boring section, 4.04 miles of grading and surfacing, Sta. 160, at Damascus, to Sta. 373, at Boring, and oil surfacing 382 to 392. Roadbed width, 30 feet; surface 18 feet wide, six inches deep. Work by Oregon Contract Company, contractor. County forces in 1928. Work begun May, 1927; completed October, 1928. Total cost, $40,961.15, market road funds. Expended, 1927, $36,315.68; expended, 1928, $4,645.47. This project was started in 1927 with expectation of paving in 1928. Fall rains made it impossible to get on the full amount of rock so to allow for full settlement; rest of the rock was put on in 1928. It is the plan to either oil or pave in 1928 and, as $11,000 of bond funds per mile are available, it will probably be paved. With the exception of 1,000 feet at Boring, this will provide a paved road all the way from Oregon City to the Mt. Hood Loop road east of Boring.

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Damascus-County Line Market Road No. 18

The only work on this section, with exception of regular maintenance, was the repair of a washout in 1927. Cost, $163.33.

Barton-Eagle Creek Market Road No. 19

Eagle Creek Bridge section, four miles north of Estacada, Sta. 194+57 to Sta. 197+57. Repair, strengthening, widening and redecking span and rebuilding approaches; also paving deck in 1928. Work by county forces; begun November, 1927; completed August, 1928. Total cost. $8,028.83, market road funds. Expended in 1927, $6,795.76; expended in 1928, $1,233.07.

Oregon City-Viola (Abernathy) Market Road No. 20

Two and seven-hundredths miles of concrete pavement and macadam shoulder, Sta. 115+00, two and one-half miles east of junction with River Road at Oregon City, to Sta. 224+00. Roadbed width, 30 feet; paved surface nine feet wide, seven inches deep, with eight-foot macadam shoulder. Paving work by Oregon Contract Company, contractor. County forces grading. Work begun June, 1927; completed December, 1927. Total cost, $30,807.24: Market road funds, $6,824.70; district funds, $1,989.54; bond fund, $22,000. A gap of 4,700 feet, Sta. 68 to Sta. 115, between this project and Oregon City, is still unimproved owing to right of way litigation through the Latourette property, which has been under way several years. It is thought that as a favorable decision was given in circuit court on new proceedings, work may proceed.

Sixty-four hundredths of a mile of grading and surfacing, Sta. 560, which is 10.6 miles east of Oregon City, on River Road, to Sta. 594. Roadbed width, 30 feet; surface 16 feet wide, six inches deep. Work by county forces; begun August, 1928; completed October, 1928. Total cost, $2,227.64: Market road funds, $1,227.64; district funds, $1,000.

Myers-Beeson Market Road No. 21

Sixty-eight hundredths of a mile of grading and surfacing beginning 5.5 miles east of Messinger Corner on Market Road No. 11, which is nine miles southeast of Oregon City, Sta. 290 to Sta. 310, graded only, and Sta. 237 to Sta. 253 graded and surfaced, base only. Roadbed width, 32 feet; surface 12 feet wide, six inches deep. Work by county forces; begun May, 1928; completed July, 1928. Total cost, $2,019.09: Market road funds, $1,394.72; district funds, $624.37.

Oregon City-Mulino Market Road No. 22

Spangler Hill section, 1.40 miles of slide removal and repair, Sta. 25, which is 1,500 feet north of Mulino, to Sta. 100, which is 6.6 miles south of Oregon City. Roadbed width, 30 feet; surface 18 feet wide, six inches deep. Work by county forces; total cost, $1,211.23, market road funds. Each winter extensive slides have come down in this area, especially between Sta. 25 and Sta. 40. This has made necessary additional culverts and tile and additional surfacing.

Spangler Hill section three miles, Sta. 158+81, which is 6.35 miles from city limits of Oregon City, to Sta. 00 at Mulino. This project was

[CLACKAMAS]

graded and surfaced in 1925 and 1926 and was to be mainly financed by a tax voted by a special road district which included Molalla and Oregon City. The levy was collected in 1925 but in 1926 the matter was taken to court and with an adverse decision no special tax was collected in 1926. In 1927 the work had been done and the expense incurred and no provision in budget to pay. As the work had been properly a market road the remaining expense, amounting to $20,589.58, was paid with market road funds.

Beaver Creek section, 0.13 mile of concrete pavement and macadam shoulder Sta. 164, which is 3.1 miles south of Oregon City, to Sta. 171+05. Roadbed width, 32 feet; paved surface nine feet wide, seven inches deep, with eight-foot macadam shoulder. Work by Hopkins Company, contractor. County forces grading and shoulder. Work begun August, 1927; completed August, 1927. Total cost, $1,724.57: Market road funds. This gap was left when rest of the road was paved to allow for installation of a large concrete culvert and settlement of the fill. With the exception of the Spangler Hill section, 159 stations in length, there is now continuous pavement from Oregon City to Hermans Corner, about two miles south of Molalla.

South End Market Road No. 23

Twilight School-New Era section, 1.66 miles of grading, surfacing and oiling, Sta. 114+31, at the end of pavement about two miles south of Oregon City, to Sta. 202+05, where this road joins the Pacific Highway at New Era. Roadbed width, 30 feet; surface 18 feet wide, 8 inches deep. Oiling work by State Highway Department, county forces grading and macadam. Work begun March, 1928; completed September, 1928. Total cost, $13,573.99: Market road funds, $12,073.99; state highway funds, $1,500. Expended in 1927 for survey, $148.51; expended in 1928, $13,-425.48. This road was to be used as a detour for part and, at times, all of the Pacific Highway traffic during revision and widening of the Pacific Highway between Canemah and New Era. At normal times there is very little traffic between end of the pavement and New Era; partly for this reason and the immediate need of this detour very little grading was done. The alignment is very good but grades are quite steep in places and local needs would never justify their reduction. For use of the detour the State Highway Department contributed $1,500 toward the grading and surfacing of the road. Also the highway department oiled and maintained the road throughout the rest of the year. The cost of the oiling and maintenance is not a county expenditure and no figures are reported.

Oregon City-Brown's School Market Road No. 24

Twenty-one hundredths of a mile of grading and surfacing, Sta. 130+50, which is 2.5 miles south of city limits of Oregon City, to Sta. 142. Roadbed width, 30 feet. Work by county forces; begun and completed in 1927. Total cost, $1,388.82: Market road funds. This section was partly graded and surfaced in 1926 from Sta. 129 to Sta. 180. Regrading and widening completed in 1927 from Sta. 130+50 to Sta. 142.

Sixty hundredths of a mile of grading and surfacing, Sta. 147 to Sta. 163, begins 2.8 miles south of city limits of Oregon City and Sta. 0+00

at city limits to beginning of pavement at Sta. 15+76. Roadbed width, 32 feet; surface 18 feet wide, 8 inches deep. Work by county forces; begun April, 1928; completed June, 1928. Total cost, $8,323.32, market road funds. This project, Sta. 0+00 to Sta. 15+76, was heavy work and, on account of right-of-way difficulties, had been held up several years. As this was a necessary part of the detour to take the Pacific Highway traffic during reconstruction of the Canemah-New Era section of the Pacific Highway, a line revision was made and right-of-way settled. This section being a part of the detour, was oiled and maintained by the State Highway Department without cost to the county.

O'Neils Corner-Molalla-Wilhoit Market Road No. 25

Milk Creek Bridge and Molalla-Wilhoit sections, 2.28 miles of grading, concrete paving and bridging, graded Sta. 280 to Sta. 328 (0+00 at Molalla) graded and paved Sta. 52+80 to Sta. 122 (0+00 at Molalla), erected bridge across Milk River at Sta. 187+50 to Sta. 190+80 (0+00 at O'Neil's Corner on Pacific Highway about one and one-half miles north of Canby). Roadbed width, 32 feet; paved surface nine feet wide, seven inches deep. Paving work by Rigdon Brothers, contractors; county forces grading and bridge. Work begun March, 1927; completed December, 1927. Total cost, $28,980.98: Market road funds. Grading cost, $11,618.49; paving, $11,861.49; Milk Creek bridge, $4,176.48; and engineering, $1,324.02. In 1926, owing to a large and increasing volume of traffic and the narrow width as well as a bad angle, the steel bridge across Johnson Creek at Milwaukie became inadequate and dangerous and was replaced with a suitable concrete bridge. In 1927 this steel span was erected at Milk River, where, erected on tangent and less traffic, it will serve satisfactorily for years. Paving was started at Sta. 52+80 at the end of a one mile section of pavement put down south of Molalla in 1923.

Mulino-Wilhoit section, 0.16 mile of concrete paving and erecting of Wright's Bridge, paved Sta. 84 to 92+40 (1.60 miles south of Molalla), Wright's Bridge 1.30 miles south of Mulino. Roadbed width, 32 feet; paved surface nine feet wide, seven inches deep and eight-foot macadam shoulder. Work by Gilpin Construction Company on bridge and S. Simonsen on paving. County forces on grading; work begun April, 1928; completed December, 1928. Total cost, $42,182.77: Market road funds, $41,581.34; district funds, $601.43. The section paved was a gap left for settlement in the 1927 project; surfacing cost was $6,500 and Wright's Bridge, complete with approaches, cost $35,682.34. The old bridge with long approaches had several curves on the approaches. The new alignment is tangent.

Boones Ferry-County Line Market Road No. 27

County Line-Wilsonville section, 1.48 miles of oiling, Sta. 0+00 at the Marion County line, to Sta. 130+45 at Boones Ferry at Wilsonville. Roadbed width, 30 feet; surface 16 feet wide, eight inches deep. Oiled with light oil. Work by county forces; begun June, 1928; completed June, 1928. Total cost, $611.72: Market road funds.

Wilsonville-North section, surveys only. Cost, $130.01, in 1927.

[CLACKAMAS]

Parkplace-Springwater Market Road No. 28

Cape Horn section, 1.38 miles grading and macadam, Sta. 149, which is 2.72 miles from Parkplace Bridge, to Sta. 222 at end of pavement. Roadbed width, 32 feet; surface 18 feet wide, eight inches deep. Work by county forces; begun May, 1928; completed November, 1928. Total cost, $22,618.97: Market road funds. Expended in 1927 for surveys, $284.14; expended in 1928, $21,334.83. This section, called Cape Horn, is the only part of Market Road No. 28 which is not paved. The old road was a one-way road in cemented gravel along the south side of the Clackamas River and, at times, was under high water. On account of expense this section has been delayed as long as possible. Baker Bridge at Carver, which has turned all traffic east of Cape Horn onto other roads, is in bad shape and will have to be replaced. This road is necessary during this time. Early in 1928 an accident in which people were killed occurred at the grade crossing just east of Parkplace. The Public Service Commission ordered a hearing and then ordered a grade separation by building the road under the Southern Pacific Railroad bridge. The county and the railroad were each to pay half the cost, which was estimated to be about $12,000. There is objection on the part of local people who claim that the new road would be under water at times. Also the court has not been able to acquire right-of-way. A rehearing was asked but no decision has been rendered at this date.

Boring-Sycamore Market Road No. 30

Eighty-seven hundredths of a mile of grading and crushed rock surfacing, Sta. 92 is 1.75 miles from 0+00 of this road at Sta. 17+70 from Multnomah County line on Market Road No. 18, to Sta. 138. Roadbed width, 32 feet; surface nine feet wide, eight inches deep. Work by county forces; begun in 1927; completed in December, 1928. Total cost, $8,364.67: Market road funds, $7,914.67; district funds, $450. Expended in 1927: For grading, $5,443.03; expended in 1928, for surfacing, $2,921.64.

Oswego-County Line (Upper Boones Ferry) Market Road No. 31

Oswego section, 0.82 mile of grading and concrete paving, Sta. 0+00, at intersection with Pacific Highway in Oswego, to Sta. 43+00. Roadbed width 32 feet; paved surface 16 feet wide, seven inches deep. Paving work by Hopkins Company, contractor; grading by county forces. Work begun May, 1927; completed October, 1927. Total cost, $14,046.45: Market road funds, $40,046.45; district and city funds, $7,000; donation fund, $3,000. This section begins in Oswego, and city and others donated more than half of the cost of the improvement. Property owners arranged with the contractor and paved both sides full street width for two or three blocks.

Ninety-two hundredths of a mile of oil-surface treatment, Sta. 43, end of pavement 0.8 mile west of Oswego, to Sta. 92. Oiling macadam surface with light oil. Work by county forces; begun and completed in 1928. Total cost, $1,242.95: Market road funds.

Molalla-Hubbard Market Road No. 32

Molalla west section, 2.88 miles of grading and macadam, Sta. 0+00, at Molalla west to Sta. 60 at Market Road No. 5 equals 0+00 to Sta. 92.

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Roadbed width, 32 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun June, 1928; completed July, 1928. Total cost, $16,-407.42: Market road funds, $14,938.11; district funds, $1,469.31. Grading cost $4,398.65 and surfacing $12,008.77.

Sandy-Eagle Creek Market Road No. 33

One and twenty-nine hundredths miles of grading and surfacing, Sta. 68 (0+00 at Sandy) to Sta. 128. Roadbed width, 32 feet; surface nine feet wide, eight inches deep. Graded and base surfacing in 1927 and in 1928 top surfacing. Also survey from Sta. 128 to Sta. 334. Work by county forces; begun June, 1927; completed September, 1928. Total cost, $10,577.10: Market road funds, $10,165.24; general funds, $161.80; district funds, $250. Expended in 1927 for grading and surfacing, $9,254.97; expended in 1928 for resurfacing, $1,322.13.

Oatfield Market Road No. 34

Patching and pavement repair at Sta. 0+00 near Parkplace to Sta. 280 at Milwaukie. Work by county forces; begun and completed in 1928. Total cost, $846.27: Market road funds.

Estacada-Colton Market Road No. 35

Dix section, 0.59 mile grading, surfacing and clearing, Sta. 0+00 at Colton to Sta. 31, graded and surfaced; Sta. 0+00 to Sta. 403+83, cleared. Roadbed width, 32 feet; surface 12 feet wide, 8 inches deep, Clearing work by Fischer Brothers, contractors; grading by county forces; begun and completed in October, 1928. Total cost, $8,234.84, market road funds.

Dix to Springwater section, 0.80 mile of grading and surfacing, Sta. 62 to Sta. 93 (0+00 at Colton) and Sta. 409 to Sta. 420. Roadbed width, 32 feet; surface 12 feet wide, 8 inches deep. Work by county forces; begun March, 1928; completed September, 1928. Total cost, $908.58, O. & C. funds.

Lower Highland Market Road No. 36

East end section connecting with Market Road No. 21, 0.43 mile of grading and surfacing, Sta. 247 to Sta. 270. Roadbed width, 32 feet; surface 12 feet wide, 6 inches deep. Work by county forces, begun May, 1928; completed July, 1928. Total cost, $5,087.17: Market road funds, $3,838.43; district funds, $1,248.74.

Fifty-seven hundredths of a mile grading and surfacing, Sta. 0+00, 3,680 feet west of junction with Market Road No. 11, to Sta. 30. Roadbed width, 32 feet; surface, 16 feet wide, 8 inches deep. Work by county forces; completed in 1927. Total cost, $5,721.53, market road funds.

82d Street Market Road No. 38

Oregon City-Parkplace section, one mile of shoulder widening, Sta. 0+00 at city limits, to Sta. 52+80. Roadbed width, 32 feet. Work by county forces; completed in 1927. Total cost $4,955.28, market road funds. On this section the roadbed was hardly wider than the pavement and with the guard fence almost rotted away. This was extremely dangerous and delayed traffic. Late in 1926 gravel and sand were hauled and the roadbed widened 8 to 10 feet on each side.

[CLACKAMAS]

Oregon City-Parkplace and Pope Hill section, 11 hundredths mile of bituminous pavement, Sta. 53+50 to Sta. 59+50 at Parkplace paved and Sta. 265 at Pope Hill 6 by 12-foot box culvert. Roadbed width, 32 feet; bituminous pavement 20 feet wide, two and one-half inches deep. Work by county forces; begun July, 1928; completed November, 1928. Total cost, $5,153.28, market road funds. At Parkplace replaced two sharp curves with one long flat curve and widened and put on high super-elevation. At Pope Hill put in concrete box culvert preparatory to grading in 1929 and eliminating two dangerous curves.

Rock Creek Bridge to Redland Store Market Road No. 39

From Market Road No. 28 South section, 63 hundredths of a mile grading and surfacing, Sta. 79 to Sta. 99 (0+00 at junction north No. 16) and Sta. 172 to Sta. 185. Roadbed width, 32 feet; surface nine feet wide, eight inches deep. Work by county forces; begun June, 1928; completed November, 1928. Total cost, $9,197.57: Market road funds, $7,804.64; district funds, $1,392.93. Two road districts had voted special levies to the extent of $1,392.93 and market road funds were used to complete projects; grading $8,400.

CLATSOP COUNTY

Since the beginning in 1920 a total of $963,678.19 has been made available for market roads in Clatsop County, of which $369,317.81 was from the state market road appropriation, $357,534.29 from county market road levies, and approximately $236,826.09 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this amount $938,785.76 has been expended and the following work accomplished: 30.70 miles graded; 13.64 miles surfaced; 14.57 miles paved; and maintenance during the last four years costing $25,025.81.

During the last two years, $278,415.23 has been spent and 10.66 miles graded; 6.74 miles surfaced; and maintenance costing $23,642.84 performed.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement				
		Paved with Bituminous Pavement	Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Miles Crossing to Olney	11.40	.....	11.40	.....	.....	.....
2. Hamlet Junction-Ecola-Cannon Beach	13.80	.....	.....	6.60	1.60	5.60
3. Svensen Crossing South	3.00	1.20	.....	.....	.....	1.80
4. Little and Big Walluski Loop	3.70	.....	.....	3.70	.....	.....
5. Svensen to Knappa via Hillcrest Road	5.50	.....	1.20	2.30	.....	2.00
6. Nehalem	36.50	.....	13.80	.....	12.00	10.70
7. Lewis & Clark-Wahanna	14.00	3.80	.....	5.00	.....	5.20
Total	87.90	5.00	26.40	17.60	13.60	25.30

During the past two years the road improvement program of the county has changed from concrete paving to a grading and macadam program. The Svensen market road has been regraded and macadamized and completed. The Walluski Loop has been graded and rock surfaced. The Knappa-Hill Crest road only needs ditching and a general clean-up to bring it to sufficient standard. The Wahanna road is now surfaced all the way through. Major effort has been centered on grading the Nehalem road from the summit to Jewell and this road will take the greater part of the county's funds for three or four years yet to complete. The most difficult mile of the Cannon Beach road has been graded and this road will probably continue with the Nehalem road as one of the two major projects. Macadam surfacing has been delayed as grading was pushed ahead. It is hoped in another year that all macadam work can be contracted as the county has no tractors, blades, or other equipment to properly prepare subgrade and process macadam.

Maintenance work has been neglected and the county has neither organization nor equipment to properly carry on maintenance. The maintenance done has been very costly and needs reorganizing for both better results and lower costs. There is a vast amount of work, repairing pavement, ditching, clearing and building shoulders, etc., to be done and

[CLATSOP]

which the incoming court has agreed to organize and do. They also plan to install a more complete cost keeping system so that accurate costs can be known and uneconomic methods, machines, etc., discarded.

The county court consists of Judge J. S. Cornelius and Commissioners John Frye and William Larsen. Arthur F. Danielson is County Engineer.

Miles Crossing to Olney Market Road No. 1

Paving of the entire project was completed in 1925, except shoulders and ditches, which work is still to be done.

Hamlet Junction-Ecola-Cannon Beach Market Road No. 2

Owing to the demand for a through road from Cannon Beach to Nehalem, the court decided to abandon for the present any reconstruction between Hamlet Junction and Cannon Beach and to push work ahead for a connection. With this idea in view, a contract was let in October, 1926, to Hazard & Underwood for grading from Sta. 564 to Sta. 785; the work was about 70 per cent completed in 1926, and practically completed in 1927. Expended in 1926, $38,750.95 and expended in 1927, $19,581.93. There are some slides to be taken out in 1929.

In 1928 a surfacing project was done by county forces from Sta. 335 to Sta. 360. This is a temporary surface 12 feet wide by seven inches deep to enable people owning lots to get to them to build. Principal traffic goes onto the beach at Sta. 335. Expended, $1,982.53.

Svensen Crossing South Market Road No. 3

Paving was contemplated for this project but was not approved as there was neither sufficient width of grade nor rock on the road. In 1927 a contract for grading 24-foot width macadam 16 feet by eight inches was let to A. B. Gerding. Cost $5,559.24 and completed in 1927. The project begins at end of pavement 213 feet north of the Columbia River Highway and extends north to Svensen station on the railroad.

Little and Big Walluski Loop Market Road No. 4

In 1926 contract to grade Sta. 0+00 near county hospital to Sta. 112 was awarded to A. B. Gerding and later extended to a connection with the Nehalem Road No. 6 at Sta. 193. In 1926 $17,689.65 was spent and the project was completed in 1927. Cost, $12,738.88; total cost, $30,428.53. In 1927 a few hundred cubic yards of rock were placed on the road. County has no record of the cost. In 1928 the entire project was surfaced, the rock being delivered by contract to nearby bunkers and placed by county forces. Macadam 16 feet by seven inches. Cost, $15,069.32. This is the best piece of macadam the county has ever put down.

Svensen-Knappa-Hillcrest Market Road No. 5

No work on this project in two-year period except $5,000 spent in 1928 in widening cuts in several places.

Nehalem Market Road No. 6

In 1926 grade and base surfacing completed to Fish Hawk summit at Sta. 1009. In 1927 grading contract Sta. 1009 to Sta. 1154 at Fish Hawk

Falls, awarded to Moon Brothers. Grading about 65 per cent completed at a cost of $27,632.11. As much of old road was destroyed and travel had to be kept going, the county spent $20,356.15 in temporary surfacing. The contractor failed and bonding company made arrangements with court to finish the job. In 1928 county forces and A. B. Gerding on force account spent $15,487.05 on grading and taking out slides. Project about 95 per cent complete.

In 1928 grading contract Sta. 1161, at Fish Hawk Falls, to Sta. 1387 at Jewell, awarded to A. B. Gerding and completed. Cost, $42,914.49. A permanent rock crusher set up was made at Fish Hawk Falls. Sections between the summit at Sta. 1009 and Jewell where new grading destroyed existing surface were temporarily surfaced. Cost, $16,863. Complete surfacing from end of pavement at Sta. 733 to Jewell, at Sta. 1367, is contemplated in 1929.

Wahanna Market Road No. 7

In 1927 county forces surfaced Mile Post 11.1 to 12.2 at a cost of $6,250 and in 1928 surfaced Mile Post 10.4 to 11.1 and resurfaced Mile Post 11.1 to 13.4 at a cost of $5,337.50. Surface nine feet by six inches. These last two sections replaced the last of the plank surface on this road.

COLUMBIA COUNTY

Since the beginning in 1920 a total of $761,026.92 has been made available for market roads to Columbia County, of which $218,894.37 was from the state market road appropriation, $269,938.98 from county market road levies, and approximately $272,193.57 from cooperative funds such as district specials, motor license funds, O. & C. funds, general funds, etc. Of this amount $734,674.25 has been expended and the following work accomplished: 59.32 miles graded; 59.75 miles surfaced; 1.79 miles paved; major bridges costing $9,605; and maintenance during the last four years costing $13,014.15.

During the last two years $269,316.72 has been spent and the following accomplished: 31.56 miles graded; 32.72 miles surfaced; 1.79 miles paved; major bridges costing $9,605; and maintenance costing $10,772.82.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement			
		Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standard	Not Graded to Market Road Standard
1. Pittsburg-St. Helens	25.00	0.40	16.60	.....	8.00
2. Rainier-Apiary	6.33	.....	6.33	.....	.....
3. Mist-Clatskanie	12.00	.....	7.80	.....	4.20
4. Nehalem Highway	33.00	1.00	22.50	.....	9.50
5. Vernonia-Buxton	4.50	.....	2.20	1.00	1.30
6. Delena-Quincy Loop	10.00	.....	0.75	.....	9.25
7. Beaver Basin	7.00	.....	.....	.....	7.00
8. North Scappoose Creek	8.00	.....	1.35	.....	6.65
9. Liberty Canyon	6.00	.....	.....	.....	6.00
Total	111.83	1.40	57.53	1.00	51.90

During the past two years the Fall Creek section of the Mist-Clatskanie market road has been completed and opened to traffic, practically all of the market road fund being used on this project. The widening and revision work on the St. Helens-Pittsburg market road has continued in several places. This road, on account of the growth of Vernonia and timber development in that vicinity, has such a traffic that the present road is inadequate. As soon as macadam surface is widened and settled an oil treatment is put on. This work will be continued. The Beaver Creek Road No. 5 from the end of macadam has been graded and surfaced, using all district funds. Work on the Nehalem Road No 4 has continued with district special levies and great progress made. At the present time the road has been graded and surfaced from Vernonia to the Washington County line with one or two miles of the earliest sections to be worked over. From Vernonia to the county line there remains less than six miles to grade and surface and one bridge to replace. District No. 9 should finish the two miles at Pittsburg during the coming year but District No. 8 failed to vote a special tax this year so improvement will stop for a year at least.

Oiling has been tried out and has been quite successful near St. Helens, but in the vicinity of Vernonia it has not held up so well. It is evident that this is due, to a great extent, to the poor quality of rock.

Maintenance has been quite well organized and the county has plenty of equipment. The organization, however, still depends on the individual and in one or two sections results are not as good as should be. Maintenance funds practically all come from the general road fund.

Conditions as a whole regarding market road work in this county are very satisfactory and very good work is being done. The work is under direction of the court of which the members are John Philip, Judge, and J. N. Miller and T. B. Mills, Commissioners. G. G. Hall, Roadmaster and County Engineer, was succeeded in 1928 by J. W. Barney.

Pittsburg-St. Helens Market Road No. 1

Trenholm-Pittsburg section, 2.24 miles of line revision and surfacing, Sta. 15+08 to 118 in 1927, Sta. 0+00 to 15+08 in 1928 (0+00 at Pittsburg). Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun July, 1927; completed September, 1928. Total cost, $10,533.36: Market road funds, $4,439.68; special district funds, $6,049.88; general road funds, $43.80. Expended in 1927, $9,439.-68; expended in 1928, $1,093.68. Straightened alignment using steam shovel and hauling material, widened surface from 12 feet to 16 feet. This project was graded and surfaced as the first Columbia County market road project.

Trenholm-Pittsburg section, 0.13 mile grading and bridge over small creek at Wilark, Sta. 569+50 (0+00 at Columbia River Highway at Houlton) to Sta. 576+50. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun August, 1928; completed October, 1928. Total cost, $2,400.47: Market road funds, $2,351.49; general road funds, $48.98. Existing bridge collapsed and was replaced by a 4 by 10 concrete culvert in revised alignment.

Houlton-Yankton section at Sta. 106+50. A 45-foot steel I-beam span replacing light span, width 20 feet. Work by county forces; begun October, 1928, completed November, 1928. Total cost, $2,740.78, general road funds.

Houlton-Yankton section, 2.06 miles of realigning and surfacing, Sta. 42 (0+00 on Columbia River Highway at Houlton) to Sta. 150+50. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun March, 1927. Cost, $8,181.18: General road funds, $5,649.71; district fund $2,531.47. Expended in 1927, $5,588.16; expended in 1928, $2,593.02. This work consisted of widening, ditching and straightening up existing road and putting on new top surface.

Mist-Clatskanie Market Road No. 3

Summit-Clatskanie section, 7.82 miles of grading and surfacing. Sta. 42, which is 3.93 miles north of Mist at junction of old road, to Sta. 454+50 at junction with Columbia River Highway at Clatskanie. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Work by county forces, begun March, 1927; completed October, 1928. Total cost, $101,-167.60, market road funds. The sections from Sta. 222 to 279 and Sta. 279 to 357 were graded in 1924 and 1925. Slides were removed and some widening and straightening done and included in the above costs. The entire road is surfaced and was opened to traffic in the fall. It is quite

[COLUMBIA]

a relief to traffic as the old road was narrow and had very sharp curves and grades up to 18 or 20 per cent. It is the intention of the court to widen and straighten the 3.93 miles between the project and Mist in 1928, this section having been built in 1915. Very good cost data are available on this project. The sections between Sta. 279, 359 and 222 to 279 in 1924 and 1925 were graded by contract at a cost of $61,408.38. These sections and costs are not figured in the tabulation below. The rest of the grading was done by county forces with a gas shovel and tractors with revolving fresnoes. Surfacing was also done by county forces.

GRADING

Right of way (purchase)	$ 850.00
Clearing and grubbing	11,228.06
Grading	37,516.94
Drainage	10,127.80
Bridge	737.91
Rental grading equipment at $0.04 cu. yd.	6,781.48
Engineering	3,493.51
Total grading	$70,735.70

Total excavation unclassified including solid rock and intermediate material 169,537 cu. yds. average cost per cu. yd. $0.26.

SURFACING

Crushing	$14,216.86
Process and spread	1,365.46
Rock hauling	11,368.08
Rental on crushing equipment at $0.20 per cu. yd.	3,481.50
Total surfacing costs	$30,431.90

Total rock crushed 17,407.5 cu. yds.
Cost per cu. yd. in bunkers, $1.01.
Cost per cu. yd. in place on road, $1.75.
The total cost to grade and surface 7.82 miles, $169,889.52.
Cost per mile, $21,724.33.

Nehalem Market Road No. 4

Mist-Berkenfeld-County line section, 2.86 miles of grading and surfacing Sta. 0+00, at Clatsop county line, to Sta. 90 in 1927, and Sta. 90 to Sta. 150 in 1928. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun March, 1927; completed October, 1928. Total cost, $13,963.59: General fund, $387.93; special dictrict fund, $13,575.66. Expended in 1927, $9,112.50; expended in 1928, $4,851.09.

Mist-Up River section, 1.90 miles of grading and surfacing, Sta. 110 (0+00 at Mist) to Sta. 210+00 at Natal. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun May, 1927; completed October, 1927. Total cost, $11,932.84: Special district fund (1926), $6,097.66; special district fund (1927), $5,835.18. All work done in 1927 partly with funds carried over from 1926.

Mist-Up River section, 2.12 miles of grading and surfacing, Sta. 290 (0+00 at Mist) to Sta. 401+98.2 at line between Road Districts 8 and 9. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun July, 1928; completed October, 1928. Total cost, $11,539.83: General road fund, $693.51; special district fund, $10,846.32.

District Line-Pittsburg section, 2.12 miles of grading and surfacing Sta. 290 (0+00 at Mile Bridge, one mile east of Vernonia) to Sta. 401+73.0. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun May, 1927; completed October, 1928. Total cost, $17,563.11: Market road funds, general road funds, $355.63; special district fund, $17,207.48. Expended in 1927, $3,651.62; expended in 1928, $13,911.49. Includes Cooks Bluff section graded in 1927.

[COLUMBIA]

Sheeley Bridge-North Section, 0.68 mile of grading and surfacing, Sta. 0+00 (new Sheeley Bridge at Sta. 22) to Sta. 36. Roadbed width, 24 feet; surface 18 feet wide, eight inches deep. Work by county forces; begun June, 1926; completed October, 1927. Total cost, $8,957.55, special district funds. In 1926, $1,568.33 was spent clearing and grading Sta. 0+00 to Sta. 14. This cost is not included in the above figures.

Vernonia-Washington County line section 4.18 miles of grading and surfacing Sta. 165 to Sta. 200+93 equals 0+00 of Sheeley Bridge section —Sta. 36, 1,400 feet south of Sheeley Bridge, to Sta. 145 in 1927, and Sta. 145 to Sta. 58 at Bergeson's in 1928. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun May, 1927; completed October, 1928. Total cost, $27,456.59: Special district funds, $27,073.54; general road fund, $383.05. Expended in 1927, $11,771.48; expended in 1928, $15,685.11. This completes grading and surfacing of this road from Vernonia to the Washington County line, but two or three miles at Treehorn, junction of Beaver Creek road, are lower standards and some revision will be necessary. This work has all been done with special road district levies under the district supervisor.

Vernonia-Washington County line section, steel bridge over Nehalem River at Sta. 3 to Sta. 4+60, eight miles south of Vernonia. Work by O. N. Pierce, contractor; begun June, 1928; completed October, 1928. Total cost, $9,605.10: Market road funds, $9,442.50; general road fund, $162.62. This replaced a very light steel span and is on revised alignment.

Vernonia-Pittsburg section 2.80 miles of grading and surfacing, Sta. 42+50, end of pavement two miles east of Vernonia, to Sta. 190+56. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep. Work by county forces; work begun August, 1926; completed November, 1928. Total cost, $17,828.86, special district. Expended in 1926, $9,149.02; expended in 1927, $8,679.84.

Vernonia-Buxton Market Road No. 5

County Line-North section 3.24 miles of grading and 2.38 miles of surfacing, Sta. 0+00 to Sta. 105+00 in 1927 and Sta. 105 to 171+11 at Washington County line and surfacing Sta. 0 to 126. Roadbed width, 24 feet; surface 10 feet wide, six inches deep. Grading work by C. A. Mills, contractor; county forces on surfacing. Work begun June, 1927; completed September, 1928. Total cost, $24,353.42: Special district funds, $23,749.68; general road fund, $603,74. Grading expended in 1927, $11,-838.48; expended in 1928, $8,315.16. Surfacing expended in 1928, $4,199.78. This project begins at the end of the macadam road about two miles up Beaver Creek from the Nehalem Market Road No. 4 and instead of crossing the railroad remains on the west side all the way to the Washington County line. No rock was found near this project and it was necessary to make a long haul from Rocky Point. Base only was put on to carry local traffic until Washington County connects up.

North Scappoose Creek Market Road No. 8

One and thirty-five hundredths miles of grading and surfacing, Sta. 0+00 to Sta. 70+00. Roadbed width, 20 feet; surface 14 feet, eight inches deep. Work by county forces; begun May, 1927. Total cost, $5,662.92: Special district funds, $2,288; general road fund, $3,374.92. Expended in 1927 for grading, $3,374.92; expended in 1928 for surfacing, $2,288.

COOS COUNTY

Since the beginning in 1920 a total of $1,156,394.38 has been made available for market roads in Coos County, of which $298,739.17 was from the state market road appropriation, $350,792.63 from county market road levies, and approximately $506,862.58 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. A total of $1,212,722.06 has been expended and the following work accomplished: 96.18 miles graded; 96.67 miles surfaced; maintenance during the last four years costing $46,422.73 and cooperation on state highway construction to the extent of $42,290.

During the last two years $473,445.98 has been spent and the following accomplished: 29.62 miles graded; 31.18 miles surfaced; and maintenance costing $28,229.20.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Myrtle Point-Sitkum	20.00	17.50	1.00	1.50
2. Norway-Lee-Fairview	12.00	12.00	.....	.....
3. Allegany	7.00	.....	6.00	1.00
4. Myrtle Point-Lampa	12.00	8.50	0.50	3.00
5. North Bank	15.00	10.00	4.00	1.00
6. Coos River	5.90	5.90	.....	.....
7. North Bend-South Slough	7.50	7.50	.....	.....
8. Bear Creek	6.00	3.50	.....	2.50
9. Coquille-Fairview	13.00	13.00	.....	.....
10. Coquille-Dement Ranch-Fat Elk	8.80	7.00	.....	1.80
11. Two Mile	5.50	1.50	0.50	3.50
12. Myrtle Point-Cooper Bridge	3.50	3.00	.....	0.50
13. Lee-McKinley	7.00	7.00	.....	.....
14. Lakeside	7.00	.....	1.50	5.50
15. North Slough	2.50	1.50	.....	1.00
16. Haynes Slough	6.00	3.50	.....	2.50
17. Larson Slough	4.00	1.00	.....	3.00
18. Ross Slough	3.00	.....	3.00	.....
19. Catching Creek	8.00	8.00	.....	.....
20. Myrtle Point-Broadbent	7.50	6.50	.....	1.00
21. Hoffman to Powers	18.00	18.00	.....	.....
22. Fishtrap Landing	2.00	1.00	.....	1.00
23. Catching Slough	6.80	4.60	.....	2.20
Total	188.00	140.50	16.50	31.00

The two-year period just passed shows a wonderful accomplishment in Coos County. Construction and maintenance forces have been well organized and well equipped. All roads are being well maintained at a reasonable cost. On several roads the last section of planked surface has been torn up and replaced with rock. Many small bridges have been filled and many others replaced with new bridges.

On Coos River, the road on the north side—Allegany—lacks about three-quarters of a mile yet to complete. This section is through the jetty rock quarry and a temporary road can be built at any time. A ferry is to be established at the forks and a bridge built at Allegany. This will open up a road all the way from Scottsburg via Loon Lake to Marshfield. The quarry opened up two years ago opposite the Austin place has

proven to be a very excellent surfacing material and has about cut in half the cost of surfacing material around Coos Bay as it is barged to many projects and the crushing cost is low.

On the north bank of Coquille River, grading is carried well down river and another year's work will see this road graded and surfaced to Bullard's Ferry at Bandon. Two sources of cheap but satisfactory gravel were located and these materially advanced progress.

Many miles of good macadam roads radiate from all the towns and with good maintenance give good all-year roads. The organization is efficient in all phases of the road work and is one of the three or four best in the state. The county can well feel proud of the work accomplished.

Judge R. H. Mast, Commissioners Matt Hockards and Jas. Jenkins compose the county court. James Caughill is County Engineer and W. A. Gilbert County Roadmaster.

Myrtle Point-Sitkum Market Road No. 1

In 1927 surfaced 12 feet wide by 6 inches deep from Sta. 631 at Dora to approximately Sta. 1063 at Sitkum. Cost, $14,439.16, of which local road district paid $10,600.42. In 1928 county forces placed 2,852 cubic yards of crushed rock resurfacing east of Sitkum in Brewster Valley extending over about four and one-half miles at a cost of $5,987.63, all paid out of local road district special tax. No survey has been made beyond Dora as road was well graded and planked a number of years ago and no additional grading is being done.

In 1927 grading contract from Sta. 185 at north end of Cooper's Bridge, to Strong Ranch at Sta. 104, was awarded to Peart Brothers and $3,896.23 spent in that year. Completed in 1928 at a total cost of $17,-897.22, of which local district paid $11,194.45. In 1928 county forces graded Strong Ranch, Sta. 104, to Lewellen Lane section, Sta. 43, at a cost of $13,767.99, local district paying $2,744.49 of this. This project is to be eliminated by a new road on the west side of Coquille River; Cooper's Bridge, which is unsafe and, to renew, would cost almost as much as the new road.

Allegany Market Road No. 3

In 1928 for grading, Sta. 7, at Allegany, to Sta. 69, awarded to Dan Plymale. Sta. 7 to Sta. 39 widen and complete previous project. Cost to date, $21,404.61, of which amount $8,495.15 was district funds. A small amount of finishing remains to be done. Grading Sta. 69 to Sta. 132+75 was completed in October, 1928, by D. P. Plymale at a cost of $19,725, of which amount general funds paid $1,017.84 and district fund paid $10,595.18.

In 1927 and 1928 Baker and Scharschmidt graded Sta. 132+75 to Sta. 190+50 at a total cost of $31,144.27, only $1,136.60 being paid out of market road funds.

In 1927 the Condron Ranch Section, Sta. 227+50 to Sta. 249, was graded by Peart Brothers at a cost of $3,731.44, all paid from bond fund. In 1927 Pat Hennessy completed the section from Sta. 330 to Sta. 359, started in 1925, at a total cost of $26,602.29, of which $4,532.36 was paid from market road funds. In 1927 Peart Brothers finished grading the Austin-Dix section, Sta. 359 to Sta. 382, total cost $13,694.12, all paid from bond fund.

[COOS]

Myrtle Point-Lampa Market Road No. 4

In 1927 contract was awarded to Joe Lett for grading Sta. 275 to Sta. 323+39 on Lampa Creek connecting with the Roosevelt Highway. Cost $5,604.14. This same section was surfaced by county forces with pit-run gravel at a cost of $2,330.30.

Hall's Creek-Arago section, Sta. 60 to Sta. 105, was graded in 1927 by Contractor Sandy Ellis at a cost of $3,860.90. Sta. 62 to Sta. 102 surfaced in 1928 by county forces with pit-run gravel at a cost of $2,748.98.

Lampa Creek section, Sta. 60 to Sta. 88, was graded and surfaced with pit-run material by county forces in 1927 at a cost of $2,605.86. In 1927 Spruce Street extension from Myrtle Point, Sta. 9 to Sta. 83, was graded and surfaced by county forces at a cost of $7,080.21.

North Bank Market Road No. 5

In 1927 and 1928 Baker and Schardschmidt graded Sta. 501 to Sta. 558 at a cost of $11,379.09.

In 1927 county forces completed a project started in 1926, spending $3,669.03 to complete.

Dredge fills, Sta. 120 to 136 and 488 to 502 and Sta. 66 to 79+50; truck fill Sta. 3 to 30.

Base surfacing Sta. 66 to 490, top Sta. 66 to 282 and bridges at Sta. 791+50 and Sta. 794+25. County forces built fill and culvert at Sta. 53+47 and surfaced Sta. 0 to Sta. 66 at a cost of $2,715.84 in 1927. Grading contract of William Wilkins, Sta. 557 to Sta. 680, completed in 1928 at a cost of $14,668.98; county forces placed 705 yards gravel Sta. 444 to Sta. 575 at a cost of $912.75 to carry traffic until spring when a cheaper source of surfacing will be available.

Coos River Market Road No. 6

County forces in 1927 surfaced Sta. 51+50 to Sta. 275, repaired grade, removed slides, etc., at a cost of $22,818.56. In 1928 contract was awarded to McLeod Brothers for riprap Sta. 51+50 to Sta. 120 at a cost of $13,761.61. County forces placed additional surfacing Sta. 51+50 to Sta. 275; cost, $508.35.

North Bend-South Slough Market Road No. 7

In 1927 county forces took out sand slides.

North Bend-Empire section scarified and added clay binder to macadam, Sta. 40 to Sta. 196+51 at a cost of $1,861.58. One thousand nine hundred and twenty-five cubic yards of gravel resurfacing was added to above stations at a cost of $5,956.42.

In 1928 the section from Sta. 32 to Sta. 246+50 resurfaced with Coos River rock by county forces at a cost of $6,912.70, Sta. 32 being about six-tenths of a mile south of Empire. From North Bend to Empire, Sta. 0+00 to Sta. 185 to 32 was oiled by county forces with light oil at a cost of $672.88 for the entire project. This road is the principal road from Coos Bay cities to the beaches and receives a very concentrated local traffic and is now in fine condition.

[coos]

Bear Creek Market Road No. 8

No construction on this road except in 1928 widening at Sta. 286+50 at a cost of $750.97, of which $604.47 was district funds.

Coquille-Fairview Market Road No. 9

In 1927 small bridges were built by county bridge crews at Stas. 139+13, 153+23, 263+50, 331+00 at a cost of $5,982.01, all paid with O. & C. funds.

In 1928 county forces graded and surfaced the county park section, Sta. 0 to Sta. 40, and repaired and surfaced Sta. 189+50 to Sta. 198 where washouts had occurred. Cost, $3,227.17.

Coquille-Dement Ranch-Fat Elk Market Road No. 10

Grading, started in 1925, from Sta. 0 to Sta. 110 was completed by Peart Brothers in 1927. Surfacing was done with pit run gravel by county forces. Total cost of project, $29,149.13; cost to complete in 1927, $16,213.71. This surfacing is base course only and merely lets out local residents. In 1927 grading and base surfacing nine feet by eight inches was completed by county forces from Sta. 202 to Sta. 235, cost, $2,199.79 of which special tax paid $247, O. & C. funds $1,332.22 and donations $620.57. In 1928 county forces graded and surfaced Sta. 203 to Sta. 216 and resurfaced Sta. 0 to Sta. 40. Cost, $4,584.06, of which district funds paid $1,858.89.

Two Mile Market Road No. 11

In 1927 county forces built a trestle at Sta. 72 and graded and surfaced Sta. 97 to Sta. 100 and Sta. 170 to Sta. 171+70. Cost, $767.35, district funds paying $600.

In 1928 county forces graded Sta. 102 to Sta. 108 and surfaced Sta. 95 to Sta. 108. Cost, $953.53, general funds paying $773.53. Surface nine feet by eight inches.

Myrtle Point-Cooper's Bridge Market Road No. 12

No work except maintenance on this road in 1927 and 1928. The county court built an extension of this road from Cooper's bridge on the south side to Lusk Bridge as a county road.

Lee-McKinley Market Road No. 13

This project completed in 1926 except two miles at the end which is rocked but not standard.

Lakeside Market Road No. 14

In 1927 county forces graded at Shutler's Landing east from Sta. 340 to Sta. 413. Cost, $10,080.46, of which district funds paid $6,993.57. Fourteen-foot class "C" roadbed. In 1928 county forces graded near Shutler's Landing from Sta. 318 to Sta. 361 at a cost of $10,667.54, of which district funds paid $2,001.21 and general funds $2,499.90. Roadbed 14-foot Class "C."

Ross Slough Market Road No. 18

Contract for grading Sta. 0+00 at Catching Slough Bridge to Sta. 42 awarded to Wm. Able in 1926 and cost in 1926 $2,480.80. Grading com-

[COOS]

pleted in 1927 at a total cost of $12,971.93. County forces surfaced in 1926 and 1927 from east side to Catching Slough Bridge, Sta. 0 to Sta. 42+94, at a cost of $9,253.65, which included a plant set-up.

In 1928 county forces graded from Sta. 120 to Sta. 183 at a cost of $7,388.26, of which the district paid $2,762.55. County forces also resurfaced from Catching Slough Bridge to East Side Sta. 0+00 to Sta. 42+94 at a cost of $1,144.36. In 1927 contract was awarded to William Wilkins for grading Sta. 40 to Sta. 120. Cost, $10,039.74, of which $3,775.58 was paid from O. & C. fund.

Catching Creek Market Road No. 19

Contract awarded in 1927 to T. J. Halstead to build seven small trestles. Cost, $9,550; $6,303.69 paid from O. & C. fund.

In 1928 county forces put on gravel at the junction of market roads 19 and 20 at a cost of $245.50.

Myrtle Point-Broadbent Market Road No. 20

In 1927 T. J. Halstead built one small trestle costing $1,822.73. Repairs on Spruce Street Bridge in Myrtle Point cost $1,424.82, of which O. & C. fund paid $715.91.

Hoffman-Powers Market Road No. 21

In 1927 county forces graded Sta. 282 to Sta. 649 and resurfaced Sta. 282 to Sta. 794. Cost, $43,030.70, district funds paying $9,019.34 and bond fund $27,502.43. This project was started in 1926 and $27,502.43 spent on it that year.

In 1927 slide removal and additional gravel surfacing cost $10,091.69, of which district special paid $3,834.70.

In 1928 county forces graded from Hoffman Bridge to Sta. 5 to Broadbent at Sta. 139. Cost, $5,642.76, paid from district funds. This section, as well as the entire distance to Powers, was given a resurface costing $13,782.11; $9,209.55 from market road funds, $507.60 from general fund and $4,004.96 from district fund.

Fish Trap Landing Market Road No. 22

In 1927, due to a previous winter's flood, several thousand yards of material had to be replaced and slides taken out. Also surface was thickened in weak places from Sta. 0 to Sta. 50. Grading cost $2,285.51 and surfacing cost $1,272.50; O. & C. fund paying $3,506.81.

Catching Slough Market Road No. 23

County forces started grading and surfacing in 1926 and did work to the extent of $16,153.22. Work accomplished at the end of 1927 was grading, Sta. 102 to Sta. 244, and surfacing, Sta. 0+00 to Sta. 165. In 1927 work cost $25,114.86, of which general fund paid $3,265.13, district special $9,435.21 and bond funds $12,414.52.

In 1928 county forces surfaced from Sta. 13 to Sta. 239 at a cost of $12,254.72. The funds used were: Special, $11,270.25; general, $63.03; market road, $921.44. The general width on this road is 16-foot Class "C"; grade and surfacing 12 feet by eight inches deep.

CROOK COUNTY

Since the beginning in 1920 a total of $171,658.10 has been made available for market roads in Crook County, of which $75,150.42 was from the state market road appropriation, $83,245.11 from county market road levies, and approximately $13,262.57 from cooperative funds such as bonds, district specials, motor license funds, general funds, etc.

A total of $174,923.45 has been expended and the following work accomplished: 59.76 miles graded; 26.14 miles surfaced; and maintenance during the last four years costing $11,926.37.

During the last two years $32,893.38 has been spent and 5.34 miles graded; and maintenance costing $8,614.56 performed.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Bear Creek-Held	14.00	4.00	.....	10.00
2. Jap Creek	10.00	7.00	3.00	.....
3. McKay Creek	4.00	1.00	3.00	.....
4. Prineville-Williams-Madras	10.00	2.00	2.00	6.00
5. Mill Creek	2.00	2.00	.....	.....
6. Crooked River	50.00	27.00	5.00	18.00
7. Powell Butte	7.00	.....	7.00	.....
Total	97.00	43.00	20.00	34.00

A great part of the productive part of Crook County is around the head of Crooked River and the head of Bear Creek and at a long distance from the county seat at Prineville. During the past two years the Stewart grade on the Crooked River road has been graded and partly surfaced. This section was always rough and dangerous, and especially dangerous in winter. The section of the Bear Creek market road from the highway junction through the "dobe" section to where the road is in firm, sandy soil has been graded and surfaced. Surfacing of these roads is of local material and very cheap and only put on eight feet wide. Traffic is light and it is considered that more value to the public is obtained by surfacing greater distance. A small betterment project on the Jap Creek Market Road No. 2 was graded and surfaced.

On Market Road No. 4, which is a short cut from Prineville to Madras, a location has been run on practically a direct line from the end of surfacing about two and one-half miles out of Prineville to O'Neil Gap at the Jefferson County line. This line diagonals through the country and saves considerable distance and eliminates many right angle turns and cheaper construction is obtained. Right of way was acquired by resolution proceedings. As much property may change hands in the Ochoco Irrigation District, the court has let a contract for fencing and will do a little work in opening the road so that any prospective purchaser will be fully aware of the existence of the road.

Construction work is done by contract where the work is adaptable and otherwise by county forces. The construction and maintenance of market roads is handled by the County Engineer under direction of the court. Owing to light traffic and long distances the lightest types of

[CROOK]

construction have been followed, but all located and grades laid so that no changes of alignment will be necessary or will any dirt have to be moved again at a future time. Certain sections can be carried under the light traffic with no surfacing. By this method and concentrating in the places that become impassable in winter, the program has been advanced several years.

The direction of the work is under the court consisting of M. R. Biggs, Judge, and Homer Norton and Corey W. Foster, Commissioners. A. R. Schriver is County Engineer. During the latter half of 1928 Mr. Schriver has also acted as County Engineer of Jefferson County.

Bear Creek-Held Market Road No. 1

Grading and surfacing 4.26 miles, Sta. 0+00, at junction with highway to Sta. 225; one 19-foot and two 12-foot trestle spans on concrete pedestals. Roadbed width, 16 feet; surface eight feet wide, six inches deep, base only. Work by county forces; begun March, 1928; completed October, 1928. Cost, $11,593.75, market road funds.

Jap Creek Market Road No. 2

Raising a fill along an irrigation ditch, Sta. 400 to Sta. 405. Work by county forces in 1928. Cost, $602.58, market road funds.

Crooked River Market Road No. 6

Stewart Grade section, grading 2.16 miles, Sta. 0 to Sta. 114. Roadbed width, 20 feet; one 16-foot and one 10-foot spans. Work by Davis, Fuller & Hunter, contractors; begun August, 1926; completed August, 1927. Cost, $18,339.39, market road funds. Expended in 1926, $9,830.61; expended in 1927, $8,508.78.

CURRY COUNTY

Since the beginning in 1920 a total of $111,947.04 has been made available for market roads in Curry County, of which $50,596.14 was from the state market road appropriation, $50,861.84 from county market road levies, and approximately $10,489.06 from cooperative funds such as district specials, motor license funds, O. & C. funds, general funds, etc. Of this amount $115,644.86 has been expended and the following work accomplished: 15.76 miles graded; 11.15 miles surfaced; and maintenance during the last four years costing $3,669.30.

During the last two years $38,448.96 has been spent and 6.48 miles graded; 3.43 miles surfaced; and maintenance costing $2,673.82 performed.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Elk River	4.50	4.50	.....	.....
2. Oak Flat	4.00	.....	.....	4.00
3. Winchuck	3.65	2.04	.....	1.61
4. Pistol River	4.00	.....	.....	4.00
5. Floras Creek	14.00	.....	1.84	12.16
6. Sixes River	6.00	.....	0.75	5.25
7. Chetco	5.00	3.62	.....	1.38
8. Cedar Fork	13.00	.....	.....	13.00
9. Jerry Flat	4.25	1.42	.....	2.83
10. Giesel Monument-Wedderburn	4.50	.....	.....	4.50
11. Cape Blanco	5.00	0.50	.....	4.50
12. Bagnell Ferry-Alf Miller's	0.95	0.95	.....	.....
Total	68.85	13.03	2.59	53.23

During the past two years more has been accomplished on Curry County's market road system than in any other like time.

The Jerry Flat market road, extending from the old Bagnell Ferry to Gold Beach, was graded and surfaced from where the road hits the river bank nearly to Indian Creek. The old road was narrow and had many sharp curves. Some slides have occurred but have all been repaired. Except in one or two places the line was thrown into the hill. From Indian Creek, where the state highway ferry lands, to Gold Beach, state forces at state expense widened and surfaced the road so that it will require no further work except surfacing.

On the Chetco market road, completion of the projects under way in two-year period will provide a gravel surfaced road from Harbor to the Forest Boundary. Low standards were used in this road as traffic will never be heavy. There are one or two sections that need widening.

The Floras Creek market road was extended from the end of the present graded county road to the Kronkle place. Another year's project will require a bridge over Floras Creek and grading. A 10-foot roadbed was used as people now only have a trail and widening can wait until more traffic develops. Alignment and grade are such that widening can be readily done. The fund available each year in this county is small and as the traffic is light it is thought that these lower standards are justified. Each commissioner acts as roadmaster in his district and

[CURRY]

directs county forces and looks after maintenance. Nearly all construction work is contracted. The court is composed of C. H. Bailey, Judge, and E. B. Sypher and Bud McVey, Commissioners. In first part of 1927 E. F. Wann was County Engineer, superseded by B. O. Johnson, Resident Engineer, highway department, on part-time basis. In 1928 Paul Van Scoy, Resident Engineer, highway department, acted as County Engineer, with L. C. Smitton, transitman, actually handling the projects. There is no engineer residing in Curry County and there is too little work to keep one on the county payroll. It is thought that perhaps an arrangement can be made with Coos County whereby one of their men can handle this on a part-time basis.

Floras Creek Market Road No. 5

Suckau-Kronkle section, grading 1.85 miles, Sta. 0 to Sta. 90+97. Roadbed width, 10 feet; 370 feet timber bridges. Work by Finch & Holland, contractors; begun June 20, 1928; completed October 25, 1928. Cost, $8,958.89, market road funds.

Chetco Market Road No. 7

Grading and surfacing 0.63 mile, Sta. 0 to Sta. 33+50. Roadbed width, 16 feet; surface 10 feet wide, nine inches deep, bank run gravel. Work by J. R. Hill, contractor; begun July 10, 1927; completed October 1, 1927. Cost, $10,911.14, market road funds. This cost includes cost of a location made by Wann and a relocation made by B. O. Johnson, Resident Engineer. Wann's line climbed very high, had 9 per cent grades and sharp curvature. The relocation held to lighter grades and gave improved alignment at no greater cost.

Jack's Creek to Mill Creek section, grading 3.10 miles, Sta. 25 to Sta. 188 and surfacing 1.90 miles, Sta. 96 to Sta. 196. Roadbed width, 20 to 12 feet, 94 feet timber bridges; surface eight feet wide, seven inches deep, bar run gravel. Work by J. R. Hill, contractor; begun August, 1928; not complete November 1, 1928. Cost to November 1, $6,362.52, market road funds. An appropriation of $2,000 from the Forest Service will be used to extend the project one mile east of Mill Creek to a junction with the Mt. Emney forest trail. Total estimated cost, $9,665.

Jerry Flat Market Road No. 9

Grading and surfacing 0.90 mile, Sta. 0 to Sta. 47+50. Roadbed width, 12 feet; surface 10 feet wide, six inches deep, bank run gravel. Work by D. M. Moore, contractor; begun June, 1927; completed September, 1927. Cost, $9,296.45, market road funds.

DESCHUTES COUNTY

Since the beginning in 1920 a total of $336,313.74 has been made available for market roads in Deschutes County, of which $136,873.96 was from the state market road appropriation, $121,806.61 from county market road levies, and approximately $77,633.17 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this total $327,037.99 has been expended and the following work accomplished: 124.23 miles graded; 4.21 miles surfaced; maintenance during the last four years costing $9,488.24; and cooperation on state highway construction to the extent of $25,420.

During the last two years $126,345.20 has been spent and 77.10 miles graded; and maintenance costing $6,428.24 performed.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement			
		Paved with Bituminous Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Shevlin Park	2.92	.....	2.92	.....	.....
2. Redmond Northwest	5.69	.....	.....	5.69	.....
3. Terrebonne-Lower Bridge	4.93	.....	.....	4.93	.....
4. Redmond-Powell Butte	2.92	.....	.....	2.92	.....
5. Butler	5.68	.....	.....	5.68	.....
6. Arnold	2.80	.....	.....	2.80	.....
7. Metolius River (Santiam Highway	.....	.....	.....	.....	.....
8. Lower Bridge	19.11	.....	.....	19.11	.....
9. O'Neil	3.72	.....	.....	3.72	.....
10. Alfalfa	10.42	.....	.....	10.42	.....
11. Tumalo Reservoir	9.15	.....	.....	9.15	.....
12. Smith's Rock	3.74	.....	.....	3.74	.....
13. Tetherow Bridge	4.00	.....	.....	.....	4.00
14. Bend-Prineville	9.00	.....	.....	2.18	6.82
15. Nichols	4.33	.....	.....	4.33	.....
16. Gerking	2.83	.....	.....	2.83	.....
17. Camp Polk	2.00	.....	.....	.....	2.00
18. Tumalo-Oline Falls	6.57	.....	.....	6.57	.....
19. Swalley Bridge	1.70	.....	.....	.....	1.70
20. White Rock	3.65	.....	.....	3.65	.....
21. Couch	3.95	.....	.....	3.95	.....
22. Bailey	0.80	.....	.....	.....	0.80
23. Cline Buttes-Plainview	6.20	.....	.....	.....	6.20
24. Innes	4.05	.....	.....	4.05	.....
25. Peninsula	3.50	.....	.....	.....	3.50
26. Almeter	1.50	.....	.....	.....	1.50
27. Whitted	3.52	.....	.....	3.52	.....
28. Forked Horn Butte	1.50	.....	.....	.....	1.50
29. Sedgwick	2.20	.....	.....	.....	2.20
30. Redmond-Tetherow Butte	2.20	.....	.....	.....	2.20
31. Cornelius	1.50	.....	.....	.....	1.50
32. Wester	0.50	.....	.....	.....	0.50
33. Sturdevan	3.00	.....	.....	.....	3.00
34. Deschutes-Pleasant Ridge	3.60	.....	.....	.....	3.60
35. Bend-Deschutes	5.00	.....	.....	.....	5.00
36. Pilot Butte Ranch	2.20	.....	.....	.....	2.20
37. Reynolds	1.40	.....	.....	.....	1.40
38. Johnston Ranch	4.00	.....	.....	.....	4.00
39. Hamilton	3.00	.....	.....	.....	3.00
40. Ward	4.50	.....	.....	.....	4.50
41. Gasney	4.00	.....	.....	.....	4.00
42. Fort Rock	6.50	.....	.....	.....	6.50
43. Spring River	3.80	.....	.....	.....	3.80
44. Little River	6.20	.....	.....	.....	6.20
45. Reed	1.07	.....	.....	1.07	.....
46. J. H. Scott	0.14	0.14	.....	.....	.....
52. Century Drive	10.43	.....	.....	10.43	.....
Totals	195.42	0.14	2.92	110.74	81.62

[DESCHUTES]

As the program of market road construction was necessarily slow owing to the fact that the total market road fund of the county was only large enough to finance a few miles each year, Judge R. W. Sawyer suggested the plan of a $185,000 bond issue to be spent in completing the more important market roads of the system at once and using the market road fund for five years to pay off this debt. After selection of about 100 miles for this improvement, the County Court put up the plan to various organizations with the further explanation that the work could be done cheaper and better with proper organization and equipment. On May 20, 1926, this bond issue was voted on and passed. It was late in the season before the bonds could be sold and work started. A 60 caterpillar tractor was purchased and later a 12-foot blade and the work laid out as much as possible to be suitable for this equipment. A section of 40 feet between ditches, which provides a 24-foot roadbed, was generally used. Teams and fresnoes drifted the material and borrowed to fill low places. Sections not suitable for this type were contracted to team outfits. Very fine results were obtained by these methods and many other counties are now using this plan or a modification and have greatly reduced their cost of doing work. An inspection of the cost and work accomplished on the individual projects shows very low cost per mile.

As the soil is sandy, these roads settle and become compacted and handle local travel without a surface. Places which show weakness are graveled.

This program continued until the latter part of 1927 and most of the bond roads were completed when a bank failure tied up the funds. Late in 1928 sufficient funds were available to build the Arnold Road and Century Drive.

Maintenance is well organized and equipped and the organization handles both county and market road maintenance and considerable construction. The organization is efficient and the costs correspondingly low.

The work has been under direction of the County Court, Judge R. W. Sawyer, until his appointment as State Highway Commissioner in August, 1927, and since then by H. H. DeArmand, County Judge, and J. S. Innes and G. G. Sedgwick, Commissioners. R. B. Gould is County Engineer and Frank H. May is Roadmaster in charge of maintenance.

This program has provided a system of good roads which very well takes care of the entire county, and as these roads are always in first-class condition trading centers are easily reached.

Redmond-Powell Butte Market Road No. 4

McKenzie Highway-County line section, grading 2.86 miles, Sta. 0 on McKenzie Highway, east of Redmond, to Sta. 153 on the Crook County line. Roadbed width, 20 and 24 feet. Work by county forces; begun May, 1927; completed June, 1927. Cost, $4,061.73.

Butler Market Road No. 5

Grading 5.56 miles, Sta. 0 at Bend, northeast to Sta. 296+68 at junction with Bend-Prineville market road. Roadbed width, 20 feet. Drainage by county forces; grading by H. Earl Cross, contractor; work begun February, 1927; completed May, 1927. Cost, $13,248.70, market road funds.

[DESCHUTES]

Arnold Market Road No. 6

Highway to Knott Field section, grading 2.80 miles, Sta. 0 on highway two miles east of Bend, southerly, to Sta. 148. Roadbed width, 20 feet. Work by county forces and Dan Mirich, contractor; begun December, 1927; completed August, 1928. Cost, $8,246.81, market road bond funds. This project was originally intended to extend to Sta. 251+90, near Roberts Ranch, but due to right of way difficulties only 2.8 miles were completed.

Metolius River Market Road No. 7

Grading 9.55 miles, Sta. 0 at Sisters, to Sta. 504+30 on the Deschutes-Jefferson County line. Roadbed width, 30 and 26 feet. Work by county forces, begun May, 1927; completed December, 1927. Cost, $22,691.89, market road funds, $17,489.97; forest funds, $4,999.25; general road fund, $202.67. This market road has been accepted by the State Highway Commission as a part of the Santiam Highway.

Lower Bridge Market Road No. 8

Becker section, grading 3.87 miles, Sta. 0, four miles north of Tumalo, to Sta. 204+42 near Tumalo. Roadbed width, 24 feet. Drainage and grader work by county forces, grading by Wm. Endicott, contractor. Work begun November, 1926; completed May, 1927. Cost $6,782.41, market road funds.

Tumalo Reservoir Market Road No. 11

Deschutes River to Bull Creek Dam, grading 4.65 miles, Sta. 0, on Sisters Bend Highway near Tumalo, west to Sta. 245+65 at the dam. Roadbed width, 20 feet. Drainage by county forces; grading by Edgington & Harrington, contractors. Work begun December, 1926; completed April, 1927. Cost, $12,121.57, market road funds.

Plainview-Cloverdale section, grading 4.45 miles, Sta. 0, on the Sisters-Bend Highway, to Sta. 237+64 on the Sisters-Redmond Highway. Roadbed width, 20 feet. Work by county forces; contract work begun April, 1927; completed June, 1927. Cost $6,571.36, market road funds.

Smith's Rock Market Road No. 12

Grading 3.74 miles, Sta. 0 on The Dalles-California Highway at Terrebonne, east to Sta. 197+23 at county line. Roadbed width, 18 feet. Grading and clearing by H. Earl Cross, contractor. Drainage by county forces. Work begun November, 1926; completed March, 1927. Cost, $13,490.77, market road bond funds. Expended in 1926, $1,592.72; expended in 1927, $11,898.05.

Bend-Prineville Market Road No. 14

Alfalfa-Butler section, grading 2.18 miles, Sta. 0, on the alfalfa market road, six miles east of Bend, to Sta. 114+91.9 at the junction with the Butler market road. Roadbed width, 20 and 24 feet. Work by county forces; begun August, 1928; completed October, 1928. Cost, $5,539.02, market road bond funds. Sta. 68 to Sta. 82 was not graded due to right of way difficulties.

[DESCHUTES]

Whitted Market Road No. 27

Grading 3.48 miles, Sta. 0 on the Sisters-Redmond Highway west of Redmond, to Sta. 187+11, on The Dalles-California Highway, south of Redmond. Roadbed width, 20 feet. Work by county forces and J. E. Hallyburton, contractor. Work begun May, 1927; completed August, 1927. Cost, $8,506.46: Market road funds, $7,955.96; general road fund, $550.50.

Nichols Market Road No. 15

Grading 4.33 miles, Sta. 0 near Tumalo east across The Dalles-California Highway to Sta. 228+74 at Deschutes station. Roadbed width, 20 feet; 171 feet bridges constructed by Luther Metke. Heavy grading by Wm. Malone, contractor, and grader work and clearing by county forces. Work begun November, 1926; completed March, 1927. Cost, $13,267.66, market road bond funds. Expended in 1926, $1,332.91; expended, 1927, $11,934.75.

Gerking Market Road No. 16

Grading 2.83 miles, Sta. 0 on the highway one mile northwest of Tumalo, to Sta. 149+38.7 on the Innes market road. Roadbed width, 24 feet. Work by county forces; begun February, 1927; completed April, 1927. Cost, $2,393.23: Market road funds, $351.59; road funds, $2,041.64.

Tumalo-Cline Falls Market Road No. 18

Grading 6.50 miles, Sta. minus 12+85.8 at Lower Bridge market road to Sta. 333+91 on Sisters-Redmond Highway. Roadbed width, 24 feet. Drainage and grader work by county forces. Team work by Wm. Endicott, contractor. Work begun February, 1927; completed August, 1927. Cost, $8,531.82: Market road funds, $7,304.82; general funds, $1,227.

White Rock Market Road No. 20

Grading 3.65 miles, Sta. 0, on the Lower Bridge market road, three miles north of Tumalo east, north and west to Sta. 214+14.8 on the Lower Bridge market road, four and one-half miles north of Tumalo. Roadbed width, 20 and 24 feet. Work by county forces; begun January, 1927; completed May, 1927. Cost $3,699.22: Market road funds, $484.98; road funds, $3,214.24.

Couch Market Road No. 21

Grading 3.36 miles, Sta. 0 on the highway, two miles northwest of Tumalo, to Sta. 191+57.2, near the Tumalo Reservoir Dam. Roadbed width, 24 and 20 feet. Work by county forces; begun February, 1926; completed May, 1926. Cost $5,430.45: Market road funds, $582.75; road funds, $4,848.70. Sta. 165 to Sta. 172 and Sta. 184 to Sta. 191+57.2, and 1,016.3 feet of wye spur are not graded. Loss of funds in bank failure stopped this work.

Innes Market Road No. 24

Grading 4.05 miles, Sta. 0, on Lower Bridge market road, west to Sta. 213+93 on Sisters Bend Highway. Roadbed width, 20 feet. Grader work and drainage by county forces; team work by C. G. Shaw, contractor. Work begun December, 1926; completed April, 1927. Cost, $6,298.48, market road funds.

[DESCHUTES]

Reed Market Road No. 45

Grading 1.07 miles, Sta. 0, on The Dalles-California Highway south of Bend east to Sta. 56+60. Roadbed width, 20 feet. Drainage by county forces; grading by Anton Aune, contractor. Work begun November, 1926; completed March,1927. Cost, $3,040.32, market road funds.

Century Drive Market Road No. 52

Bend-Forest Boundary section, grading 10.43 miles, Sta. 0, at Bend, to Sta. 545+76 Forest Boundary. Roadbed width, 24 feet. Work by county forces; begun October, 1928; completed December, 1928. Cost, $16,928.35, market road funds. Project complete except some culverts to be installed.

DOUGLAS COUNTY

Since the beginning in 1920 a total of $970,068.55 has been made available for market roads in Douglas County, of which $359,934.65 was from the state market road appropriation, $380,644.94 from county market road levies, and approximately $229,488.96 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this amount $963,795.08 has been expended and the following work accomplished: 84.30 miles graded; 100.66 miles surfaced; 3.81 miles paved; major bridges costing $151,700; maintenance during the last four years costing $38,130.50; cooperation on state highway construction to the extent of $2,149, and cooperation on Forest Highway to the extent of $125,009.

During the last two years $336,178.24 has been spent and the following accomplished: 14.91 miles graded; 9.47 miles surfaced; 2.25 miles paved; major bridges costing $93,321; and maintenance costing $34,536.99.

Douglas County's bridge problem has been lessened by construction of a new steel bridge at Smith's Ferry and reconstruction of Beckley Bridge at Elkton, and by the Scottsburg Bridge now under construction, as well as by numerous smaller structures built the past two years. The Drain-Reedsport Market Road No. 2 has been placed on the federal aid system and it is hoped this road can be pushed to completion with market road, super district and federal aid funds.

The county maintained 191 miles of market roads in 1928, using equipment best fitted to various types of construction. Maintenance of bridges is a large item and many old wooden trestles and bridges will require replacement soon.

Market road work has been performed by contract and county forces under the direction of County Judge George Quine and County Commissioners Huron Clough, Charley Beckley and Clyde Beckley. Engineering and construction has been handled by Floyd Frear, county roadmaster and engineer for years. The Bureau of Public Roads handled engineering on Tiller Trail and State Highway Department on the Scottsburg Bridge.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement				
		Paved with Bituminous Pavement	Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Canyonville-Trail	39.20	.....	.....	25.00	6.20	8.00
2. Drain-Reedsport	52.00	.....	.....	52.00	.....	.....
3. Loon Lake	18.00	.....	.....	.....	10.00	8.00
4. North Umpqua	45.50	.....	.....	24.00	15.00	6.50
5. Reston Loop	20.00	.....	.....	16.00	.....	4.00
6. Edenbower	19.10	.....	1.75	17.35	.....	.....
7. Yoncalla-Elkhead-Milltown	9.70	.....	.....	9.70	.....	.....
8. Scotts Valley	9.00	.....	.....	6.00	1.00	2.00
9. Sutherlin-Umpqua	8.80	.....	.....	8.80	.....	.....
10. Oakland-Elkton	28.80	.....	.....	25.80	.....	3.00
11. Beckleys	9.60	.....	.....	3.70	.....	5.90
12. Glendale	3.20	.....	3.20	.....	.....	.....
13. Roseburg-Melrose	7.10	0.40	1.30	5.40	.....	.....
Totals	270.00	0.40	6.25	193.75	32.20	37.40

Canyonville Trail Market Road No. 1

Drew section, 2.60 miles grade from Sta. 24, about five miles southeast of Tiller on east to Sta. 161. Roadbed width, 14 feet. Work by Rust Bros., contractors; begun July, 1928. Cost to November 1, $14,657.05: Market road funds, $872.01; general funds, $4,657.05; district funds, $1,806.58; O. & C. tax, $7,321.41; and B. P. R. about $7,500, not included in total above. Estimated total cost, $31,000.

Drain-Reedsport Market Road No. 2

Handcock Mountain section, 1.38 miles surfacing, Sta. 192 at top of Handcock Mountain east to Sta. 265, which is 800 feet south of Elk Creek Bridge, 10 miles west of Drain. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, one and one-half inch crushed gravel. Work by county forces; begun September, 1928; completed October 31, 1928. Total cost, $5,142.10: Market road funds, $4,370.50; O. & C. tax funds, $771.60. The old planks were removed and grade and supers shaped up.

Scottsburg bridge, steel spans and concrete approaches. Work by Clackamas Construction Company, contractors, begun June, 1928, to be finished in 1929. Estimated cost, $101,976; apportioned 20 per cent market road, 20 per cent super district funds and 60 per cent federal aid. County costs to November 1, $15,100, market road funds, and $4,778 from general road fund for right of way half a mile east through town. Replaces ferry. Design and inspection by State Highway Department.

At request of Douglas County the Highway Commission made location survey from Scottsburg to Elkton in 1927. Cost, $12,731.58, paid from market road funds.

Loon Lake Market Road No. 3

Last section, 4.66 miles grading, Sta. 65 on Loon Lake to Sta. 311+24 on Mill Creek. Roadbed width, 12 feet. Work by Ivor J. Rosten, contractor; begun August, 1927; completed September, 1928. Total cost, $87,061.02: Market road funds, $66,239.65; O. and C. tax funds, $16,193.60; district funds, $4,627.77. This completes grade from Umpqua River to Boaks Landing on Loon Lake, 10 miles in all, and was a difficult section. The road district has voted a special tax to gravel this road in 1929.

North Umpqua Market Road No. 4

De Barnardi and Idlyld sections, 1.33 miles grading and surfacing, about 22 miles east of Roseburg. Sta. 1056 to 1098 and Sta. 1212 to Sta. 1234. Roadbed width, 20 feet; surface 10 feet wide, 5 inches deep, gravel. Work by Clyde Catchin, contractor, and county forces; begun April, 1927; completed November, 1927. Total cost, $11,575.47: Market road funds, $678; O. and C. funds, $8,544.07; district fund, $2,353.40.

Hatchery Bridge, 21.6 miles east from Roseburg, 84 feet timber trestle. Oscar Joelson, contractor. Cost, $1,204.80: Market road funds, $454.80; general fund, $25; and O. & C. tax, $725.

Reston Loop Market Road No. 5

Buell section, 0.1 mile, Sta. 407, 10 miles southwest of Roseburg, to Sta. 413. Roadbed width, 20 feet; surface 10 feet wide, 5 inches deep "Lookingglass" gravel. Work by county forces; begun July, 1927; completed August, 1927. Cost $563.94, district funds.

[DOUGLAS]

Bushnell section, 0.63 mile grading and surfacing, Sta. 856 to Sta. 889, about three miles north of Coos Bay Highway. Roadbed 16 feet surface, and 8 feet by 5 inches gravel. Work by county forces; begun July, 1927; completed October, 1928. Cost $1,551.15: District, $1,026.05; market road, $525.10.

Edenbower Market Road No. 6

Brown's Bridge section, 3.2 miles resurface preparation for oil, Sta. 92+25, end of concrete pavement 1.75 miles west of Pacific Highway to Sta. 258 at Brown's Bridge over Umpqua River. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, gravel. Work by county forces; begun March, 1928. Cost $3,089.13: Market road funds, $457.24; district funds, $2,631.89. Grade shaped up and weak stretches of macadam strengthened by adding Wilbur conglomerate, to be oiled in 1929.

Bridge at Umpqua P. O. was redecked and new approaches built in 1927 by E. R. Metzger. Cost, $6,514.19, market road funds.

Scotts Valley Market Road No. 8

Woodward section, 0.78 mile grading and 1.60 miles surfacing, Sta. 32, one mile south of Elkhead to Sta. 126+30 at Shoestring schoolhouse. Roadbed width, 20 feet; surface 10 feet wide, 5 inches deep, cinnabar ore. Work by county forces; begun August, 1927; completed October, 1928. Total cost, $3,084.79: Market road funds, $103.80; O. & C. tax funds, $2,162.97; district fund, $818.02.

Oakland-Elkton Market Road No. 10

Kesterson-Haines Hill section, 1.49 miles grading, Sta. 138+50 to Sta. 217 top Haines Hill and 3.10 miles base surface Sta. 5—11 and Sta. 60 top Kesterson Hill to Sta. 217 top Haines Hill. Roadbed width, 20 feet; surface 10 feet wide, 5 inches deep crushed gravel. Work by county forces; begun July, 1927; completed December, 1928. Cost to November 1, $17,158.63: Market road funds, $2,244.81; O. & C. tax funds, $10,378.09; district fund, $3,910.73; general fund, $625.

Smith Ferry Bridge, Sta. 159+65 to Sta. 166+81, steel span 450 feet, timber approaches 226 feet, tongue and groove deck. Clyde Catching, contractor, started work April 23, 1928. Cost to November 1, $23,783.55, market road fund. Estimated total cost, $53,156. Bridge will be finished early in 1929 and will replace old ferry with steep grades. When the bridge is opened this entire market road can be traveled all year.

Rochester Bridge section, 0.16 mile grading and surfacing and rip-rap. Sta. 206 four miles west of Oakland to Sta. 214. Roadbed width, 20 feet; surface nine feet wide, and eight inches deep, gravel. Work by Wells & Cathcart, contractors; begun July, 1927; completed August, 1927. Cost $2,674.12, market road funds.

Chas. Hamilton Bridge, 5.35 miles west of Oakland, 50-foot timber trestle built by Joelson in October, 1928. Cost, $786, market road funds.

Cobb-Hutchinson section, 0.28 mile grading and base surfacing, Sta. 912 to 922 and 935 to 940. Roadbed 20 feet wide, base 8 feet wide, 5 inches thick gravel. Work by county forces; begun August, 1928; completed September, 1928. Cost, $2,369.61: District fund, $1,249.75; O. & C. tax $1,055.60; market road, $64.26.

Beckley's Market Road No. 11

The bridge across Umpqua at Elkton built in 1925 was washed out by flood in February, 1927. Two piers overturned, one steel span was left on river bank, half a mile down stream and smaller span wrecked several miles down. Poor pier footings and extreme flood caused loss.

The grade was raised, two new piers were set down into solid rock and poured in the dry, one span salvaged and re-erected, together with one new span. Work by Olds, Badraun & Catching, contractors, and county forces on approach fills. Work begun June, 1927; completed October, 1928. Cost, $41,354.02: Market road funds, $36,834.02; O. & C. funds, $4,500.

Glendale Market Road No. 12

East section, 1.37 miles concrete paving, Sta. 86+34 to Sta. 158+50 at Pacific Highway. Pavement width, 9 feet; gravel 9 feet wide. Work by Taylor & Coen, contractors; begun July, 1927; completed November, 1927. Cost, $21,018.74: Market road funds, $12,988.95; O. & C. tax funds, $1,193.50; district fund, $6,831.29.

Windy Creek Bridge half mile east of Glendale, 78-foot timber trestle built by Clyde Catching, contractor, in June, 1927. Cost $1,784.16, market road fund.

Glendale Bridge redecked, new stringers by county forces in September and October, 1928. Cost, $2,253.70: Market road fund, $2,035.80; O. & C. tax, $217.90.

Windy Creek section, 0.1 mile concrete pavement, Sta. minus 2+55 Windy Creek Bridge to Sta. minus 7+54 Glendale Bridge over Cow Creek. Roadbed width, 24 feet; pavement 16 feet wide, 6 to 9 inches deep. Work by E. R. Metzger, contractor; begun June, 1928; completed September, 1928. Cost, $3,166.46.

Melrose Market Road No. 13

Seventy one-hundredths mile grade and concrete pavement from Sta. 52 end of 1926 paving job, one and one-half miles west of Roseburg west to Sta. 89. Roadbed width, 24 feet pavement 16 feet wide, 6 to 9 inches deep; $2.07 per square yard in 1927 and $2.10 per square yard in 1928. Work by E. R. Metzger, contractor; begun July, 1927; completed October, 1928. Cost, $17,338.91: Market road funds, $11,183.93; district funds, $6,154.98. A good job was secured and test cylinders showed high strength.

GILLIAM COUNTY

Since the beginning in 1920 a total of $279,861.90 has been made available for market roads in Gilliam County, of which $131,525.62 was from the state market road appropriation, $139,315.39 from the county market road levies, and approximately $9,020.89 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. Of this amount $266,713.05 has been expended and the following work accomplished: 23.85 miles graded; 18.65 miles surfaced; major bridge costing $7,368 and maintenance during the last four years costing $2,475.45.

During the last two years $46,230.74 has been spent and the following accomplished: 5.62 miles graded; 3.42 miles surfaced, and maintenance costing $1,194.88.

Owing to the condition of county finances, practically no road work was done in Gilliam County for several years, except on market roads. These projects were all contracted and the engineering work done by K. D. Lytle, Resident Engineer, State Highway Department, and succeeded, upon Mr. Lytle's transfer to The Dalles, by J. R. Mitchell, Resident Engineer.

In 1927 it became necessary to resurface the sections just out of Condon of the Condon-Lone Rock and the Condon-Cottonwood market roads which were graded and surfaced as bond projects in 1922 and 1923. This work was contracted and completed late in 1927.

Ramsey Canyon market road was graded in 1922 from the John Day Highway to the high flat to the east. Wehrli Canyon was graded and surfaced in 1920 and 1921 for about two miles from the John Day Highway and about half the distance in the canyon. The unsurfaced sections of these roads were rough and could not be maintained. In 1928 contract was let for completion of grading and surfacing both roads to points beyond the canyons where the roads branch out into the agricultural producing lands and where these roads can be bladed and maintained as dirt roads.

Early in 1928 the County Court purchased a heavy grader and tractor outfit and used it on maintenance and reshaping county roads. A section was located on the Condon-Lone Rock market road beyond the rock surfacing, running practically straight through the country for four miles, saving one mile in distance over the present road. On the Condon-Cottonwood market road a section beyond the rock surfacing, 10.8 miles in length, was located. These sections were located with the idea of good alignment and grades and avoiding rock work and getting work adaptable to the grader outfit and finishing with teams and fresnoes. About 15 miles of this type have been graded at a cost of around $500 per mile for a very good road. Surveys are being made for a section of the Mikkalo market road No. 9 and the Base Line market road No. 15 for this same type of construction in 1929. There are many miles of county road adapted to this or even lighter type grading with this heavy outfit. These roads can be maintained as fairly good dirt roads. The county hardly has sufficient funds to keep this grading going and do surfacing at the same time but a few of the worst places are to be surfaced.

As there has been little county road work, engineering has been done by the State Highway Department engineers, the county only being charged with such time as was actually required to locate and supervise contract work. The court has appointed a roadmaster and has a truck and blade outfit which maintains certain market roads as well as county roads. When the county had no organization, maintenance on market roads was done by state outfits and charged to the county but this arrangement has been done away with except on the Blalock Canyon market road.

The work is done by the court consisting of James R. Burns, Judge, and J. M. Hoag and Lloyd E. Smith, Commissioners. J. R. Mitchell, Resident Engineer, State Highway Department, is acting as County Engineer and "Doc" Rice as roadmaster.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Wehrli Canyon	8.00	3.40	.....	4.60
2. Cayuse Canyon	7.50	.....	.....	7.50
3. Lone Rock	15.00	.....	4.00	11.00
4. Cottonwood	25.00	6.00	.....	19.00
5. Ramsey Canyon	5.00	1.80	.....	3.20
6. Shutler	0.20	0.20	.....	.....
7. Blalock Canyon	10.00	3.50	.....	6.50
8. Thirty Mile Canyon	2.40	2.40	.....	.....
9. Mikkalo	15.00	2.20	.....	12.80
10. Clem	1.20	1.20	.....	.....
11. Quinton-Blalock Canyon	7.50	0.40	.....	7.10
12. Ferry Canyon	9.50	2.00	1.70	5.80
13. Condon-Heppner	12.50	3.00	.....	9.50
14. Olex	8.00	.....	.....	8.00
15. Base Line	15.00	.....	.....	15.00
Total	141.80	26.10	5.70	110.00

Wehrli Canyon Market Road No. 1

Grading and surfacing 1.62 miles and resurfacing 1.75 miles, Sta. 218+65 at the highway junction to Sta. 126+06 was graded and surfaced in 1920-22 to be resurfaced. Sta. 126+06—0+00 to Sta. 85+40 to be graded and surfaced. Roadbed width 16 feet; surface 10 feet wide, 8 inches deep; resurface 10 feet wide, 4 inches deep. Crusher run one-inch minus crushed rock base and top. Carl La Cont, contractor. Work begun May, 1928. Grading and base course completed November 1, 1928. Cost to November 1, $14,296.69. Estimated to complete, $4,000.

Condon-Lone Rock Market Road No. 3

Resurfacing 3.80 miles, Sta. 0 to 21+30 in city of Condon, patched with base and resurfaced. Sta. 21+30=0 at city limits to Sta. 179+79 resurfaced. Resurfaced 16 feet wide, 4 inches deep, crushed rock. Crusher run one and one-half-inch base, three-quarter-inch top. Work by A. Milne, contractor; begun October, 1927; completed December, 1927. Cost, $9,952.24, market road funds. This section was originally graded and surfaced in 1922 and 1923 with bond funds.

[GILLIAM]

Matney Flat section, grading four miles, Sta. 179+24 to Sta. 391+06. Roadbed width, 24 feet. Grader work estimated to cost $500 per mile. Estimated right of way and fencing cost for four miles, $2,550. Work by county forces; begun October, 1928; to be completed December, 1928. Estimated cost, $5,860, market road funds. Expended to November 1, 1928, $2,440 and about two miles graded. Grading will probably be completed in 1928.

Condon-Cottonwood Market Road No. 4

Condon section, resurfacing 6.4 miles, Sta. 0 east to 31+32, surfaced with base and top 16 feet wide, 8 inches deep. Sta. 0=13+83.6 at north edge of city of Condon extending west to Sta. 330+67.2 resurfaced 16 feet wide, 4 inches deep. Where required patching was done with base before resurfaced. Work by A. Milne, contractor; begun October, 1927; completed December, 1927. Cost $19,103.44: Market road funds, $17,-108.29; general funds, $1,995.16. This section was originally graded and surfaced in 1922 and 1923 with bond funds.

Condon-Ajax section, grading 10.8 miles, beginning at a point six miles west of Condon and extending to Ajax. Roadbed width, 24 feet. Grader work estimated to cost $600 per mile. Right of way and fencing costs estimated at $7,260 for 10.8 miles. Work by county forces begun October, 1928. Estimated to be completed April, 1929. Estimated cost, $18,080, general fund.

Ramsey Canyon Market Road No. 5

Surfacing 1.80 miles, Sta. 0+00 at junction with highway to Sta. 95. Graded as a market road in 1922 and 1923. Surface 10 feet wide, 8 inches deep. Crusher run one-inch minus crushed rock. Carl La Cont, contractor. Work begun July, 1928; completed December, 1928. Incomplete cost November 1, $4,443.78, market road funds.

GRANT COUNTY

Since the beginning in 1920 a total of $248,777.87 has been made available for market roads in Grant County, of which $99,669.46 was from state market road appropriation, $130,965.52 from county market road levies, and approximately $18,142.89 from cooperative funds such as bonds, motor license funds, general funds, etc. Of this total $246,462.35 has been expended and the following work accomplished: 36.86 miles graded; 3.44 miles surfaced; maintenance during the last four years costing $4,784.58 and cooperation on state highway construction to the extent of $49,460.

During the last two years $58,484.63 has been spent and the following accomplished: 8.03 miles graded; maintenance costing $3,331.55 and cooperation on state highway construction to the extent of $29,043.

The completion of almost 20 miles of macadam on the Mt. Vernon-Beech Creek-Long Creek road the past two years, is a big improvement and greatly appreciated by northern Grant County. County market road and bond funds, forest funds and state highway funds have been used. From mouth of Little Beech Creek, five miles north of Mt. Vernon, to Long Creek the route of the market road and the Pendleton-John Day Highway are identical. Also a start has been made on the road west from Long Creek to Kimberly which is a much-needed improvement.

Engineering work has been handled by L. E. Lucas, County Engineer, and by the Bureau of Public Roads. The county wants more roads and voted strong against the Dunne Bill. The County Court directing the work has consisted of Judge Orin L. Patterson and Commissioner George Yokum and R. W. Shaw.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Kimberly-Monument-Long Creek	35.20	5.00	15.20	15.00
2. Mt. Vernon-Beech Creek-County Line	28.20	1.50	7.70	19.00
3. John Day-Harney County Line	36.00	19.00	8.00	9.00
Total	99.40	25.50	30.90	43.00

Kimberly-Monument-Long Creek Market Road No. 1

Long Creek-Round Basin section, 7.15 miles grade, Sta. 3 at Long Creek to Sta. 381 top of hill east of Round Basin. Roadbed width, 18 feet. Work by Carl La Cont, contractor; begun July 5, 1928; completed October 10, 1928. Total cost, $21,472.10, all market road funds.

The old road west from Long Creek was one of the very worst in the state and a great improvement has been made in location and grade. It is planned to extend grade to Hamilton and surface will be required.

[GRANT]

Mt. Vernon-Beech Creek-County Line Market Road No. 2

Beech Creek to Long Creek section, 13.97 miles grade and surface Sta. 0 Forest Boundary on head of Beech Creek to Sta. 752+05.3 at Long Creek. Roadbed 16 feet wide; surface, 8 feet wide, 8 inches deep, crushed rock. Work by J. A. Terteling & Sons, contractors; begun July, 1926; completed October, 1928. Handled by Bureau of Public Roads who had $50,000 allotted for job. Grant County cooperation $42,501.51 market road funds; $1,821.15, general road fund; and $25,000 bond funds.

Mt. Vernon-Hot Springs section, 1.48 miles grade and surface, Sta. 0 Mt. Vernon to Sta. 78+50 at road leading to Hot Springs. Roadbed width, 16 feet; surface 12 feet wide, 8 inches deep with waterspout material. Work by county forces; begun December, 1925; completed April, 1927. Total cost, $5,884.26: Market road funds, $4,634.26; donations, $1,250. There remains 3.5 miles to grade and surface from the Hot Springs road north to the mouth of Little Beech Creek on the Pendleton-John Day Highway survey.

John Day-Harney County Line Market Road No. 3

Blue Point section, 0.1 mile grade and surface, Sta. —2+00 to Sta. —8 of Vance Creek-Brierly section. Roadbed width, 16 feet; surface 12 feet wide, 6 inches deep, broken rock. Work by H. W. Powell, contractor; begun January, 1927; completed February, 1927. Cost, $856.15, market road funds.

Silvies section, 8.3 miles grade from Harney County line north. Width, 14 feet. Work started in 1928. Grant County paid $1,012.35 market road funds for right of way or fences in 1928. The work is financed and handled by Bureau Public Roads; estimated cost about $36,000.

HARNEY COUNTY

Since the beginning in 1920 a total of $358,082.55 has been made available for market roads in Harney County, of which $124,640.27 was from the state market road appropriation, $115,635.77 from county market road levies, and approximately $117,806.51 from cooperative funds such as bonds, etc. Of this total $332,282.78 has been expended and the following work accomplished: 62.18 miles graded; 21.50 miles surfaced; cooperation on Forest Highway construction to the extent of $56,714; maintenance during the last four years costing $4,781.99 and cooperation on state highway construction to the extent of $18,622.

During the last two years $94,862.76 has been spent and the following accomplished: 7.00 miles graded; 9.50 miles surfaced; cooperation on Forest Highway construction to the extent of $16,714; maintenance costing $3,748.09 and cooperation on state highway construction to the extent of $18,622.

Harney County with a $200,000 bond fund has been able to hasten construction of the market road system. Good progress has been made on the Burns-Canyon City road and on the Burns-Drewsey road a part of which lies on the Central Oregon Highway. Hanley Lane has been surfaced making it serviceable all year.

The engineering work has been handled by the Bureau of Public Roads, State Highway Department and County Engineer J. J. Walsh. The County Court has consisted of Judge R. J. Williams and County Commissioners J. W. Buchanan and J. W. James.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Crane-Well Hill-Malheur County	35.00	12.00	12.00	11.00
2. Burns-Wright's Point-Narrows	24.00	9.50	6.00	8.50
3. Burns-Canyon City	33.00	26.00	.....	7.00
4. Burns-Drewsey-Juntura	24.70	.....	24.70	.....
Total	116.70	47.50	42.70	26.50

Burns-Narrows Market Road No. 2

Hanley Lane section, 9.50 miles. Surface from Crane Highway south to Wright's Point. Roadbed width, 20 feet; surface 12 feet wide, 6 inches deep, gravel, at $1.60 per cubic yard. Work by C. E. Silbaugh, contractor; begun August, 1927; completed February, 1928. Total cost, $21,685.72: Market road funds, $8,297,32; bond funds, $13,388.40.

On top of Wright's Point 0.8 mile was graded up and beginning two miles south of the point 2.5 miles were partially graded at cost of $592.82, market road funds.

Burns-Canyon City Market Road No. 3

Poison and Trout Creek sections, 27.4 miles grade and surface. Sta. 109+60 two miles northeast of Burns to Sta. 1575 at Grant County line. Roadbed width, 18 feet; surface 14 feet wide, 8 inches deep crushed rock.

[HARNEY]

This work is being handled by Bureau of Public Roads, and Harney County has cooperated to extent of $65,000 bond funds and $8,477.04 market road funds for right of way. Security Construction Company, contractors, on Poison Creek and Harness on Trout Creek section. The entire job should be completed this winter.

Burns-Drewsey Market Road No. 4

Vanderveer-Nigger Flat section, 7.74 miles. Roadbed width, 20 feet. Work by Jetley Bros., contractors; begun October, 1927. Estimated cost, $57,169.50: Bonds, $33,570.02; market road funds, $23,599.48.

The county is also cooperating 50 per cent on the Nigger Flat-Buchanan section of the Central Oregon Highway, 3.43 miles grade. Estimated cost, $42,859.97. County's share, $21,429.98, bond fund. The State Highway Department is handling both sections.

HOOD RIVER COUNTY

Since the beginning in 1920 a total of $276,526.73 has been made available for market roads in Hood River County, of which $127,738.59 was from the state market road appropriation, $146,087.64 from county market road levies, and approximately $2,700.50 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. A total of $276,806.71 has been expended and the following work accomplished: 16.78 miles graded; 10.62 miles surfaced; 4.30 miles paved and maintenance during the last four years costing $4,865.07.

During the last two years $54,823.23 has been spent and the following work accomplished: 6.07 miles graded; 4.21 miles surfaced; and maintenance costing $3,323.03 performed.

During 1927 and 1928 the market road program of the county has been considerably advanced. On Pomona market Road No. 2, grading was completed and the entire project surfaced in 1927. The Dee Market Road No. 4 has all been graded and surfaced from the Dee Flats to a junction with Number 9 near Tucker Grade. This gives a good all-year road to Dee and takes care of the Lost Lake travel. Considerable work was done on Number 5 between Dee and Parkdale. Tucker grade on Number 9 was reconstructed and surfaced, and while the grade is still steep, the road is wide, smooth and safe. The narrow, dangerous part of the River Road No. 8, from its intersection with the Tucker Grade about three-quarters mile to the south, has been reconstructed and widened and surfaced. The rest of this road is reasonably safe. Hood River County has a large supply of small gravel at Hood River and this is hauled out for maintenance material as well as top surfacing. The roads are always kept well bladed and are always in excellent condition and at a reasonable cost. Maintenance work is under direct supervision of Wm. Nichols.

All work is under the direction of the Court, James H. Jeffrey, Judge, and Frank Keating and Allison Fletcher, Commissioners. C. M. Hurlburt is County Engineer on part-time basis.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement			
		Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Odell	1.80	0.90	0.90	.....	.....
2. Pine Grove	2.70	0.70	2.00	.....	.....
3. West Side	6.00	2.60	3.40	.....	.....
4. Dee	8.50	.....	7.00	.....	1.50
5. Parkdale	8.30	.....	2.00	3.00	3.30
6. Belmont	3.00	.....	3.00	.....	.....
7. Bridge	0.50	.....	0.50	.....	.....
8. River	3.50	.....	2.00	.....	1.50
9. Tucker Grade	1.50	.....	1.50	.....	.....
Total	35.80	4.20	22.30	3.00	6.30

Pomona Market Road No. 2

Pine Grove section, grade and surface 0.18 mile, Sta. 0 on Mt. Hood Highway to Sta. 12+50. Roadbed width, 24 feet; surface six inches deep, pit run gravel. Grading by Anderson & Hoaglin, contractors;

[HOOD RIVER]

surfacing by county forces. Work begun September, 1926; completed 1927. Cost, $8,602.28, market road funds. Expended in 1926, $2,129.49; expended in 1927, $6,472.79.

Pine Grove section, grading and surfacing 0.35 mile, Sta. 12+50, to Sta. 31. Roadbed width, 24 feet; surface six inches deep, pit run gravel. Grading by L. W. Slutz, contractor; surfacing by county forces. Work begun April, 1927; completed July, 1927. Cost, $4,310.30, market road funds.

Dee Market Road No. 4

Summit to Stone store section, grading 1.27 miles. Surfacing 0.70 mile, resurfacing 0.57 mile, Sta. 0 to Sta. 67. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep, one-inch crushed rock base, pit run gravel top. Sta. 30 to Sta. 60 old rock was scarified, reshaped and resurfaced. Work by county forces; begun May, 1927; completed July, 1927. Cost, $3,890.06, market road funds.

Stone Store to Odell Creek section, grading 0.54 mile, surfacing 0.33 mile, resurfacing 0.21 mile, Sta. 0 to Sta. 28+50. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep, three-quarter-inch crushed rock base, pit run gravel top. Sta. 0 to Sta. 11 old rock was scarified, reshaped and resurfaced. Work by county forces; begun May, 1927; completed August, 1927. Cost, $4,737.35, market road funds.

Parkdale Market Road No. 5

Regrading 2.14 miles, resurfacing 1.06 miles, Sta. 0 to 20, Sta. 267 to 307 and Sta. 388 to 441, regraded. Sta. 274 to 304 and Sta. 415 to 441 resurfaced. Roadbed width, 24 feet; resurface 16 feet wide, four inches deep, screenings for resurface. Work by county forces; begun August, 1927; completed September, 1927. Cost, $2,574.48, market road funds.

Tucker Grade Market Road No. 9 and River Road Market Road No. 8

Grading 0.86 mile on Tucker Grade market road from Sta. 0, at top of Tucker's Grade at Moes, to Sta. 28+00 equals Sta. 8+50 on River Road and on River Road from Sta. 0+00 at Tucker Bridge, to Sta. 17+50. Roadbed width, 24 feet. Work by Iver J. Rostin, contractor; begun March, 1928; completed July, 1928. Cost, $18,573.46, market road funds.

River Road Market Road No. 8

Grading 0.74 mile, Sta. 17+50 to Sta. 56+50. Roadbed width, 24 feet. Work by Iver J. Rostin, contractor; begun April, 1928; completed July, 1928. Cost, $6,459.73, market road funds.

Surfacing 0.94 mile, Sta. 0 at Tucker Bridge, to Sta. 56+50 near Goulds. Surface 16 feet wide, eight inches deep. Work by county forces; begun September, 1928; completed October, 1928. Cost, $2,104.34: Market road funds, $1,652.80; general funds, $551.54.

Tucker Grade Market Road No. 9

Surfacing 0.53 mile, Sta. 0 to Sta. 28. Surface 16 feet wide, eight inches deep. Work by county forces; begun August, 1928; completed October, 1928. Cost, $1,566.05, market road funds.

JACKSON COUNTY

Since the beginning in 1920 a total of $819,237.18 has been made available for market roads in Jackson County, of which $363,014.83 was from the state market road appropriation, $402,459.59 from county market road levies, and approximately $53,762.76 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this amount $755,340.04 has been expended and the following work accomplished: 64.09 miles graded; 63.49 miles surfaced; 8.42 miles paved; and maintenance during the last four years costing $11,711.81.

During the last two years $144,689.72 has been spent and 14.83 miles graded; 14.23 miles surfaced; and maintenance costing $7,674.52 performed.

Jackson County has made good progress on its market road system during the past two years, completing each year about 10 per cent of the unconstructed portion. First-class macadams 16 feet wide on good line and grade with permanent drainage structures were constructed by county forces at an average cost of about $10,000 a mile. Extensive repairs were required in the spring of 1927 after the big February flood, which caused large damage to market and county roads and private property.

All construction and maintenance is handled efficiently by county forces under County Roadmaster Paul B. Rynning. The work has been directed the past two years by County Judges W. J. Hartzell, deceased, and Alex Sparrow and County Commissioners Victor Bursell and George Alford.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement			
		Paved with Bituminous Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Big Applegate	24.10	8.40	15.70	.....	.....
2. Sam's Valley	15.70	.....	9.70	4.00	2.00
3. Central Point-Sams Valley	10.70	.....	10.70	.....	.....
4. Butte Falls	16.00	.....	15.50	0.50	.....
5. Little Butte	32.00	.....	5.00	12.00	15.00
6. Dead Indian	25.00	.....	3.60	8.40	13.00
Total	123.50	8.40	60.20	24.90	30.00

Applegate Market Road No. 1

Applegate-Provolt section, 4.03 miles grade and surface, Sta. 413+00 at Applegate to Sta. 625+46.4 at Provolt on the county line. Roadbed width, 22 feet; surface 16 feet wide, six inches deep, crushed gravel, one-inch. Work by county forces; begun April 1, 1927; completed August 31, 1927. Total cost, $20,874.93, all market road funds.

A first-class job was secured which completes construction of the road from Medford to Josephine County line.

Flood damage in February, 1927, to Medford-Applegate section of this road was repaired in 1927, cost $5,706.05, and involved some new grade on new right of way, channel improvement and bank protection.

[JACKSON]

In 1927 repairs on Applegate Bridge 20 miles west of Medford by county forces cost $2,437.11, general fund. New east approach, new deck and stringers on span and new roof.

Sam's Valley Market Road No. 2

East section, 0.50 mile grade and surface from Sta. 80 about two miles east of Sam's Valley store to Sta. 106+42.8 at Beagle road. Roadbed width, 20 feet; surface 12 feet wide, eight inches deep, 1-inch crushed gravel hauled five miles to job. Work by county forces; begun July, 1927; completed August 31, 1927. Cost, $2,634.79, market road funds.

Gold Hill-Sam's Valley section, 2.62 miles grade and surface, Sta. 0 at Gold Hill to Sta. 9 beginning of 1926 macadam, Sta. 120+50 end of 1927 macadam to Sta. 250. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep, 1-inch crushed gravel. Work by county forces; begun March, 1927; completed September, 1927. Cost, $26,833.77, all market road funds.

Gold Hill-Sam's Valley section, 2.98 miles grade and surface, Sta. 250 end of 1927 macadam, to Sta. 406+58, one mile east of Sam's Valley postoffice. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun March, 1928; completed October, 1928. Cost to date, $20,370.71, market road funds, which does not include equipment rental. Total estimated cost was $24,297. Three miles east of Sam's Valley postoffice, double 3 by 6 by 28-foot concrete culvert built in 1928. Cost, $904.15. Jackson County has graded and surfaced in good shape several county roads leading into this market road during the past year.

It is 12 miles shorter through Sam's Valley from Gold Hill to Crater Lake than by Medford but there remains six miles of unconstructed road, part of which has no surface and is rough. The constructed sections are excellent macadam well maintained.

Central Point-Sam's Valley Market Road No. 3

Table Rock store section, 0.79 mile grade and surface, Sta. 292 at store, south to Sta. 333+83 at Bybee Bridge. Roadbed width, 24 feet; surface 16 feet wide, eight inches deep, 1-inch crushed gravel. Work by county forces; begun July 25, 1927; completed August 31, 1927. Cost, $4,044.29, market road funds.

The approaches to Bybee Bridge 5.4 miles north of Central Point washed out in February, 1927, were rebuilt to standard, 280 feet of timber trestle. A concrete culvert 4 by 6 by 28 feet was built 0.4 mile north of Central Point and another 4 by 6 by 34 feet built 8.06 miles north of Central Point. Approaches and culverts by county forces in 1927. Cost, $5,522.49.

At Snyder Creek 10.4 miles north of Central Point, 40-foot A frame bridge was built in 1927 to replace one lost in flood at a cost of $1,234.85, market road funds. In 1928 the Bybee Bridge was redecked with 2 by 6-foot laminated deck.

[JACKSON]

Butte Falls Market Road No. 4

In 1927 a concrete box culvert 4 by 6 by 28 feet, 4.8 miles east of junction with highway, was installed, replacing a 36-inch culvert pipe, which was too small. Constructed to state standards by county forces. Cost, $869.52, market road funds.

Little Butte Market Road No. 5

Eagle Point-Brownsboro section, 2.30 miles grade and surface, Sta. 75 east from highway to Sta. 196. Roadbed width, 20 feet; surface 16 feet wide, eight inches deep, 1-inch crushed gravel. Work by county forces; begun April, 1928. Cost to date, $20,065.09, all market road funds. Estimated total cost, $24,715.16. Greatly improved line has been secured.

Dead Indian Market Road No. 6

Pompadour section, 1.61 miles grade and surface, Sta. 0 about 0.8 mile east of Pacific Highway to Sta. 85. Roadbed width, 20 feet; surface 12 feet wide, eight to 10 inches deep, 1½-inch crushed gravel. Work by county forces; begun May, 1928; completed October, 1928. Incomplete cost, $11,337.29, market road funds. Estimated total cost, $19,293.91.

JEFFERSON COUNTY

Since the beginning in 1920 a total of $150,406.10 has been made available for market roads in Jefferson County, of which $69,154.03 was from the state market road appropriation, $65,770.38 from county market road levies, and approximately $15,481.69 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this total $147,928.95 has been expended and the following work accomplished: 52.46 miles graded; 32.92 miles surfaced; maintenance during the last four years costing $3,371.41; and cooperation on state highway construction to the extent of $37,000.

During the last two years $36,659.84 has been spent and the following accomplished: 8.96 miles graded; maintenance costing $2,084.82 and cooperation on state highway construction to the extent of $17,000.

In 1926 and 1927 there was no work except maintenance on the Jefferson County market road system, as all the market road funds were used as Jefferson County's cooperation on the Crooked River Bridge on The Dalles-California Highway.

In 1928 three construction projects and one betterment project were undertaken. From Grizzly west five miles on Market Road No. 8, the Ashwood Grade, three miles in length, and the Newell Hill on Market Road No. 2 and widening and repairing Mecca Grade on Market Road No. 1.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Madras-Mecca	12.50	4.80	7.70	.....
2. Madras-Ashwood	23.00	7.85	3.48	11.67
3. Metolius-Grizzly	18.00	4.38	2.00	11.62
4. Culver-Grandview	11.00	1.02	.....	9.98
5. Culver-Lamonta	12.00	3.07	1.82	7.11
6. Gateway-Trout Creek	3.45	2.72	0.73	.....
7. Gateway-Mecca	5.00	1.52	.....	3.48
8. Madras-Grizzly	18.00	.....	4.93	13.07
9. Lamonta-Prineville	6.00	.....	.....	6.00
Total	108.95	25.36	20.66	62.93

Jefferson County is sparsely settled, valuations are low and the market road fund is one of the lowest in the state. Most of the towns are on the highway and the population is so scattered that no one road will ever receive much traffic and the country will never produce much more or support much more population unless irrigation is resorted to. Low standard roads with narrow surfacing of local materials are necessary if sufficient mileage is to be constructed to reach out into these sparsely settled sections.

Construction work has been done by county forces until this year when two grading contracts were let. The jobs have dragged out and have increased the engineering costs, etc., so that probably no more contracts will be let.

Maintenance is very cheaply and adequately done. The work has been under the direction of the County Court, J. M. King, Judge, and W. H.

Ramsey and F. E. Stangland, Commissioners. Judge King has acted as roadmaster and has looked after both construction and maintenance. W. R. Grey was County Engineer until September and was succeeded by A. R. Schriver, who acts as County Engineer for both Crook and Jefferson Counties.

Madras-Mecca Market Road No. 1

Deschutes River-Agency Plains section, 2.74 miles of betterment, clearing, widening the Mecca Grade, Sta. 0+00 at top of grade on Agency Plains, to Sta. 150+00, at the Deschutes River Bridge at the foot of Mecca Grade. Roadbed width, 12 to 20 feet. Work by county forces; begun June, 1928; completed August, 1928. Cost, $2,470.44, market road funds. This section has 7 per cent maximum grade and was built by the Oregon Trunk Railroad Company in 1911 so that grain could be delivered from the Agency Plains area to the railroad for shipment. The track has since been pulled up so that this road now is only used for the eastern outlet for the Warm Springs Indian Reservation. There is a steel bridge across the Deschutes River at the foot of the grade, and the government has built and maintains the road beyond that point. Little maintenance work had been done on this road and it had washed badly, banks had slid in and large rocks stuck up in the roadbed. The expenditure this year was to widen and take out slides, protruding rocks and put the road generally in condition for travel.

Madras-Ashwood Market Road No. 2

Ashwood Grade section, 2.95 miles grading, Sta. 0+00 at Ashwood to Sta. 182 at the top of the grade where road forks. Roadbed width, 16 feet. Work by Brown & Harrison, contractors; begun August, 1928. Cost to date, $5,779.07, market road funds. This project follows generally the old road. The grade runs to 11 per cent in two places with generally 8 to 10 per cent. As a 5 per cent grade abandoned all old work and ran into much rock the cost was prohibitive. On any grade over 5 per cent, three miles in length, most cars use second gear. So with the small amount of money available and the light traffic to serve it was considered better to regrade and use all of the old road and to surface next year rather than to attempt a project that would take several years to complete.

Newell Hill section, 0.60 mile, Sta. 0+00 about 10 miles east of Madras, to Sta. 32. Roadbed width, 16 feet. Work by county forces; begun June, 1928. Cost, $1,711.61, market road funds. This project was surveyed and was to have been done in 1925 but the project was postponed.

Madras-Grizzly Market Road No. 8

Grizzly west section, 4.92 miles of grading, Sta. 0+00 at Grizzly postoffice and extends toward Madras intersecting with the present road at Sta. 260. Roadbed width, 20 feet. The work started in July, 1928, by the General Contract Company and completed October 1, 1928, at a cost of $6,635.27, including $615.65 for fencing the project. All paid from market road funds. Average cost per mile to grade, $1,348.62.

JOSEPHINE COUNTY

Since the beginning in 1920 a total of $251,004.82 has been made available for Market Roads in Josephine County, of which $99,867.48 was from the state market road appropriation, $150,820.34 from county market road levies, and approximately $317 from cooperative funds. A total of $271,795.87 has been expended and the following work accomplished: 40.63 miles graded; 40.63 miles surfaced, and maintenance during the last four years costing $14,432.86 performed.

During the last two years $69,124.45 has been spent and the following accomplished: 4.34 miles graded; 4.34 miles surfaced, and maintenance costing $11,258.24.

All southern Oregon had a storm late in February, 1927, which caused a destructive flood in Rogue River and its tributaries and Josephine County's roads and bridges suffered extensive damage, requiring several months to repair and costing a large part of the market road funds for 1927.

The Grants Pass-Williams market road, previously finished to Williams, was designated south 3.4 miles to the Dunkard church corner in January, 1928, and a good wide grading job completed during the summer. Base surface of gravel screened from old placer mine was placed to carry winter travel. This road has more than local importance for it is thought it will eventually be extended to the Oregon Caves.

Market roads are well maintained in Josephine County and extensive resurfacing and processing with binder on Grants Pass-Eismann road and oiling of a mile south of Grants Pass indicate betterment progress.

During the past two years work has been directed by Judge C. G. Gillette and County Commissioner L. R. Conklin and Ernest Loughridge and all market road engineering work has been handled by J. G. Bromley, County Engineer.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement	
		Surfaced with Rock or Gravel	Not Graded to Market Road Standards
1. Grants Pass-Williams	23.10	23.10	.....
2. Grants Pass-Eismann	11.00	7.50	3.50
3. Applegate Bridge-Riverbanks Farm	7.00	5.90	1.10
4. Merlin	9.30	4.30	5.00
Total	50.40	40.80	9.60

Grants Pass-Williams Market Road No. 1

Williams-Dunkard church section, 3.40 miles grade and base surface, Sta. 714 at Williams postoffice south to Sta. 900 at south end of market road. Roadbed width, 24 feet; surface 10 feet wide, 4 inches deep, screened gravel. Grading by Kincaid & McNutt; bridges by Olds & Son; surface by A. R. Anderson. Work begun June, 1928; completed November 30, 1928. Total cost to November 1, $20,630.43, all market road

funds. Expended for grading, $13,672.54, for three timber bent bridges as follows: 19 feet at China Creek, 23 feet at Marble Gulch and 61 feet at Munger Creek; a total of $2,120. Wide graded section and new alignment was used on most of this job which completes this market road in good shape.

Grants Pass-Murphy section, one mile oil. From Redwood Highway south. Work by state forces done in August, 1927. Cost, $1,265.21, market road funds. This has proved quite satisfactory.

A concrete box culvert 6 by 6 by 24 feet was built 4.9 miles south of Williams in 1927 by county forces. Cost, $1,457.64. Repair of February, 1927, flood damage on this road cost $2,636.83.

Grants Pass-Eismann Market Road No. 2

On Grants Pass-Dixie section a pile bridge 55 feet long was built in 1927 at Sta. 241, five miles west of Grants Pass. Cost, $1,178.36. From Grants Pass to Dixie, seven miles resurfaced with crushed gravel 16 feet wide, where needed, by county forces in 1927 and 1928. Filler was processed in. Total cost, $6,011.01. Repair of flood damage February, 1927, on this road cost $6,456.72 and in 1928 additional bank protection cribs cost $201.69.

Applegate Bridge-Riverbanks Farm Market Road No. 3

A frame bent bridge, 5-23 feet spans, was constructed over Shan Creek on the Applegate Bridge-Riverbanks market road by O. M. Olds at a cost of $2,174.96 in 1927. Washouts and south approach to Applegate Bridge were repaired in 1927 at a cost of $1,895.42.

Limpy Creek-Shan Creek section, 0.94 mile, grade and surface, Sta. 118 at Limpy Creek 4.9 miles north of the Redwood Highway to Sta. 170 Shan Creek. Roadbed width, 20 feet; surface 14 feet wide, 6 inches deep, screened gravel. Work by county forces; begun April, 1928; completed August, 1928. Cost, $10,725.19, all market road funds. The county's three-fourths-yard gas shovel was used to good advantage. Cost records show rock excavation cost $1.03, intermediate $0.55, and common $0.35.

Survey has been made on west to Pickett Creek near lower ferry as the court is considering this for future extension of this market road.

Merlin Market Road No. 4

A frame bent trestle bridge 46 feet long on concrete pedestals was constructed over Quartz Creek at Sta. 241 by A. R. Anderson, contractor, at a cost of $1,698.39, in 1928.

KLAMATH COUNTY

Since the beginning in 1920 a total of $745,091.65 has been made available for market roads in Klamath County, of which $262,834.61 was from the state market road appropriation, $313,610.10 from county market road levies, and approximately $168,646.94 as reported from cooperative funds such as bonds, motor license funds, general funds, etc. Of this total $695,282.61 has been expended and the following work accomplished: 72.59 miles graded; 77.89 miles surfaced; maintenance during the last four years costing $21,277.15 and cooperation on state highway construction to the extent of $16,785.

During the last two years $272,150.49 has been spent and the following accomplished: 11.60 miles graded; 41.39 miles surfaced; maintenance costing $9,963.68 and cooperation on state highway construction to the extent of $16,785. About seven miles more will be surfaced in November and December, 1928.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Kamath Falls-Midland-State Line	18.00	18.00	.....	.....
2. Olene-Bonanza-Poe Valley	14.70	14.70	.....	.....
3. Bonanza-Lorella, North Side	11.00	11.00	.....	.....
4. Bonanza-Lorella, South Side	8.15	8.15	.....	.....
5. Lorella-Langell Valley, East Side	11.30	1.40	.....	9.90
6. Lorella-Langell Valley, West Side	9.70	4.20	5.50	.....
7. Midland East to Highway	5.02	5.02	.....	.....
8. Williamson River-Chiloquin	6.80	6.80	.....	.....
9. Klamath Falls-Northwest	15.00	8.00	7.00	.....
10. Yonna Valley	4.65	4.65	.....	.....
11. Chiloquin-Klamath Agency	4.30	4.30	.....	.....
12. Whitney Bridge	1.75	0.93	0.82	.....
13. Klamath Falls-Lakeview Highway	.....	.....	.....	.....
14. Bonanza-Lorenz Mill	7.90	.....	.....	7.90
Totals	118.27	87.15	13.32	17.80

Klamath County voted a half million dollar bond issue in May, 1927, for road construction, a part of which was designated for use on certain market roads. With this and other funds rapid progress has been made the past year and it is reported 100 miles of macadam surface on county bond and market roads have been completed and many sections given all-year roads for the first time. The grading should be complete on all Klamath County's market road system in 1929. The completion of No. 1, Midland to the state line, now puts it up to California to continue this important road to a connection with the Pacific Highway at Weed.

Bonanza-Lorenz Mill road was added to this system in 1928 and placed under contract for grading. This will be finished early in 1929 and will take care of traffic while Dairy-Bly Mountain section of the Lakeview Highway is under construction and provide a short connection between Bonanza or Poe Valley and Sprague River points.

Klamath County has purchased several one-man maintainers and the class of maintenance secured is improving every year. Some of these roads carry a heavy traffic and during the long, dry season are difficult to keep smooth.

[KLAMATH]

All engineering work the past two years has been handled by County Engineer E. B. Henry and all work directed by County Judge Fred R. Goddard and County Commissioners Burrell W. Short, H. R. Dunlap and W. R. Williams.

Midland Market Road No. 1

North section, 1.80 miles resurface Sta. 0 at Highway south to Sta. 96+67 at Shaw Bertram Mill. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep, crushed rock from Miller's Hill quarry, 3,303 cubic yards at $2.33. Work by L. F. Ireton, contractor; begun June, 1927; completed July, 1927. Cost, $7,996.91, all market road funds. The original surface of cinders and coarse rock could not be kept in shape.

Midland section, 7.70 miles surface, Sta. 96+67 = Sta. 0 at Shaw Bertram Mill, to Sta. 383+48.0 = Sta. 0 Midland to Sta. 23. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep, crushed rock, 1½-inch base, ¾-inch top. Work by Joe Rocco, contractor; begun August, 1926; completed January 31, 1927. Total cost, $25,358.64, all market road funds.

Warden-State line section, 3.86 miles grade, Sta. 290, five miles south of Midland to Sta. 494, at California state line. Roadbed width, 24 feet. Work by G. I. Stebbins, contractor; begun July, 1926; completed November, 1926. Complete cost, $23,432.52: Market road funds, $10,912.34; bond funds, $11,594.58; general fund, $925.60. The fill across Miller Lake washed during the spring of 1927 and was repaired under contract to Miller and riprapped with rock by Stebbins. Cost, $2,071.97 for repair and $7,704.15 for riprap. The first figure is included in cost of surfacing contract shown below. The rock cost $1.60 per cubic yard in place.

Midland-State line section, 8.93 miles surface, Sta. 23 south of Midland to Sta. 494 at California state line. Roadbed width, 24 feet; surface 14 feet wide, 8 to 10 inches deep, crushed rock, 2-inch base, ¾-inch top, both at $1.98 per cubic yard. Work by W. D. Miller, contractor; begun July 2, 1928; completed November, 1928. Cost to November 1, $37,900.49, all bond funds. This fund includes $2,071.97 for repair of grade. Estimated total cost, $45,000. This completes an excellent macadam surface on Market Road No. 1, which is 18 miles long. From Klamath Falls courthouse to Weed via this road is 83.5 miles and takes about four hours to drive at present. The distance by Green Springs and Pacific Highway is 129 miles.

Olene-Bonanza-Poe Valley Market Road No. 2

A 10-foot wood bridge was built in 1928 at cost of $352.38, market road fund, to replace a culvert of inadequate size.

Bonanza-Lorella-North Side Market Road No. 3

In 1928 Keller Bridge was half-soled, cost $151.42, and the cut just west of Lorella was widened, cost $182.36, both from market road fund.

Bonanza-Lorella-South Side Market Road No. 4

Section A, 5.65 miles surface, Sta. 0 beginning of Market Road one mile south of Bonanza to Sta. 298+05. Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep, 2 inches crushed rock base and 1 inch crushed

[KLAMATH]

rock top. The rock was soft showing 20.4 per cent abrasion, but was best that could be found. Cost in place, $2.13 per cubic yard. Work by W. D. Miller, contractor; begun December 10, 1927; completed July, 1928. Total cost, $20,617.97, all bond funds.

Section B, 2.50 miles surface, Sta. 298+05, which is 6.6 miles southeast of Bonanza to Sta. 430 just west of Turner Hot Springs: Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep, cinders from Keller pit, at $1.50 per cubic yard in place, including water and roller. Work by L. F. Ireton, contractor; begun July 5, 1928; completed July 28, 1928. Total cost, $7,077.48, all bond funds. This completes construction of this road.

West Side Langell Valley Market Road No. 6

Entire length, 9.70 miles grade, Sta. 6+10.6 Malone Bridge, south end of road to Sta. 505, just east of Turner Hot Springs north end of road. Roadbed width, 22 feet. Work begun May, 1928, by county forces; completed November, 1928. Cost to date, $19,323.47, all bond funds.

North section 1.20 miles surface, Sta. 505 to Sta. 442. Surface 12 feet wide, 8 inches deep, Keller pit cinders. Work by L. F. Ireton, contractor; begun and completed in July, 1928. Total cost, $4,380, all bond funds.

South section, 8.50 miles surface, Sta. 6+10.6 Malone Bridge at south end of road to Sta. 442 at Canal Bridge. Roadbed width, 22 feet; surface 8 feet wide, 6 inches deep, cinders from Keller pit. Work by Dunn & Baker, contractors; begun October, 1928. Estimated cost, $15,060, all bond funds.

This will complete construction of west side road. Grading on east side road was started north from Malone Bridge in late fall of 1928.

Midland East to Highway Market Road No. 7

Entire road 5.02 miles, grade and surface, Sta. 0 about 2.5 miles east of Midland on No. 1 to Sta. 266 on The Dalles-California Highway. Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep; crushed rock, 1½-inch base, ¾-inch top. Grade by H. F. Vicory, contractor; begun September, 1926; completed December, 1926. Total cost, $10,373.75, all market road funds, except $500 from irrigation district. Surface by L. F. Ireton, contractor; begun June, 1927; completed September, 1927. Total cost, $22,859.21, all market road funds.

Chiloquin Market Road No. 8

Forest Mill section, 1.20 miles surface, Sta. 0 at Chiloquin to Sta. 63 east of mill. Surface 14 feet wide, 8 inches deep, crushed gravel, 1½-inch base, ¾-inch top. Work by L. F. Ireton, contractor; begun December, 1926; completed May, 1927. Total cost, $6,378.95, all market road funds.

Klamath Falls-Northwest Market Road No. 9

Wocus section, 8.00 miles surface, Sta. 0 at Wocus Bridge to Sta. 431 east end of market road on Shippington Road in Klamath Falls. Surface 12 feet wide, 9 inches deep. Sta. 0-280 had two-inch crushed cinder base, and Sta. 280-431 had 1½-inch crushed rock base, top all ¾-inch crushed rock. Work by G. W. Brown and Bonding Company, contractor; begun November, 1927; completed September, 1928. Total cost, $35,-169.06: Market road funds, $10,169.06; bond funds, $25,000.

Fremont Bridge over Link River, six 50-foot reinforced concrete spans 20 feet wide. Built by Joe Rocco, contractor; begun September, 1926; completed April, 1927. Total cost, $28,993.44: Market road funds, $2,341.07; bond fund, $21,652.37; Copco Power Company, $5,000.

Grading approaches to Fremont Bridge by H. F. Vicory, contractor; begun December 29, 1926; completed May, 1927. Total cost, $4,350.50, all bond funds.

Yonna Market Road No. 10

North section, 2.15 miles surface, Sta. 133+30 on Dairy-Beatty State Highway location to Sta. 215 quarter mile west of Hildebrand. Surface 12 feet wide, 8 inches deep, crushed rock 1½-inch base, ¾-inch top, both at $2.60 per cubic yard. Work by L. F. Ireton, contractor; begun November, 1927; completed May, 1928. Total cost, $13,477.10, all market road funds. Ireton also placed a base course three inches thick of 2-inch crushed rock Sta. 133+30 south to Sta. 0 on Dairy-Bonanza Highway, 2.5 miles in 1928. Total cost, $3,731.75: Market road fund, $1,001; bonds, $2,730.75. From Hildebrand north towards the town of Sprague River a county bond road of good standards is being graded in 1928.

Chiloquin-Klamath Agency Market Road No. 11

Entire road 4.30 miles surface, Sta. 17 at Chiloquin road to Sta. 246 on The Dalles-California Highway. Surface 15 feet wide, 4 inches deep, 1 inch crushed gravel. Work by L. F. Ireton, contractor; begun May, 1927; completed June, 1927. Total cost, $7,728.85, all market road funds. This road was graded and surfaced with coarse gravel by the Indian service in 1925.

Whitney Bridge Market Road No. 12

Entire road 1.75 miles, grade and north 0.93 miles surface, Sta. 0 at The Dalles-California Highway to 49 at bridge surface, and to Sta. 92+51 at state line grade. Roadbed width, 24 feet, graded by county forces; surface 12 feet wide, 8 inches deep, crushed rock, 1½-inch base, ¾-inch top, both at $2.50 per cubic yard. Work by L. F. Ireton, contractor; begun July, 1928; completed November 1, 1928. Total cost, $4,818.63, all market road funds.

Klamath Falls-Lakeview Highway, also Market Road No. 13

Klamath County planned to use $25,000 market road funds as cooperation on Bly-Forest Broadway section of Klamath Falls-Lakeview Highway, and $16,785.33 was turned over by November 1.

Bonanza-Lorenz Mill Market Road No. 14

Entire road, 7.80 miles grade and two miles surface. Sta. 355+87.5 at Bonanza to Sta. 774 on Klamath-Lakeview Highway grade, Sta. 355+87.5 to Sta. 460 surface. Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep, cinders. Work by Dunn & Baker, contractors; begun November, 1928. Estimated cost, $21,293, market road funds.

LAKE COUNTY

Since the beginning in 1920 a total of $315,513.42 has been made available for market roads in Lake County, of which $130,668.80 was from the state market road appropriation, $135,833.73 from county market road levies, and approximately $49,010.89 from cooperative funds such as bonds, motor license funds, general funds, etc. Of this total $304,870.04 has been expended and the following work accomplished: 14.28 miles graded; 11.47 miles surfaced; maintenance during the last four years costing $6,187.64 and cooperation on state highway construction to the extent of $106,504.

During the last two years $59,081.25 has been spent and the following accomplished: 2.36 miles graded; 2.36 miles surfaced; maintenance costing $4,600.50 and cooperation on state highway construction to the extent of $35,626.

A large part of the market road funds the past two years have been used as cooperation on the Fremont State Highway on which the county wished to expedite construction. A section on the Adel road was surfaced, eliminating one of the worst stretches for mud in the spring.

All market road work has been handled by B. J. Crowley, Resident Engineer, for the State Highway Commission, under the direction of County Judge H. E. Kelty and Commissioners F. S. Fisher and W. B. Snyder.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Lakeview-Adel	28.00	11.40	3.00	13.60
2. Lakeview-Klamath Falls Highway	.....	.....	.....	.....
3. Adel, North	20.00	.....	.....	20.00
4. Adel, South	7.00	.....	.....	7.00
5. Goose Lake	15.00	.....	.....	15.00
6. Bayers Creek	7.00	.....	.....	7.00
7. Silver Lake, West	16.00	.....	.....	16.00
Totals	93.00	11.40	3.00	78.60

Lakeview-Adel Market Road No. 1

Mud Creek-Blue Creek section, 2.36 miles, grade and surface. Sta. 625, 12 miles east of Fremont Highway to Sta. 751 near Blue Creek. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed rock. Work by M. P. Pau, contractor; begun June, 1928; completed September, 1928. Estimated cost, $19,474.53, market road funds.

Klamath Falls-Lakeview Highway Market Road No. 2

Expended as cooperation during the last two years, $1,783 market road funds. This was to complete grading started in 1925 by county forces. About $50,000 market road funds was expended to good advantage on this highway during the previous biennium.

Fremont Highway and Market Road No. 8

Expended as cooperation during the last two years, $33,842.82 market road funds on state projects.

LANE COUNTY

Since the beginning in 1920 a total of $1,298,700.03 has been made available for market roads in Lane County, of which $544,901.07 was from the state market road appropriation, $515,428.55 from county market road levies, and approximately $238,370.41 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds and general fund. Of this total $1,276,633.63 has been expended and the following work accomplished: 130.85 miles graded; 128.68 miles surfaced; cooperation to the extent of $34,891 on forest and bond projects; major bridges, costing $81,820; maintenance during the last four years costing $165,425.30 and cooperation on state highway construction to the extent of $102,897.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Territorial, North Section	7.10	7.10	.....	.....
2. Territorial, South Section	32.20	30.50	.....	1.70
3. Alvadore	12.40	12.40	.....	.....
4. Prairie	12.80	12.80	.....	.....
5. Fergueson	6.50	6.50	.....	.....
6. Turnbow	1.50	1.50	.....	.....
7. High Pass	8.90	8.50	.....	0.40
8. Meadow View	4.30	4.30	.....	.....
9. Georgetown	2.50	2.50	.....	.....
10. Clear Lake, East Section	5.80	5.80	.....	.....
11. Clear Lake, West Section	4.30	2.00	.....	2.30
12. Elmira	12.00	12.00	.....	.....
13. Noti	23.40	13.70	8.30	1.40
14. Poodle Creek	3.80	3.50	.....	0.30
15. Crow-Vaughn	6.90	6.90	.....	.....
16. Danebo Road	1.50	1.50	.....	.....
17. Crow	8.70	6.00	.....	2.70
18. Warren	2.30	1.00	.....	1.30
19. Hadleyville	12.60	12.60	.....	.....
20. Hawkins Hill	2.50	2.50	.....	.....
21. Torkleson	6.40	.....	3.50	2.90
22. Wolfe Creek	6.00	4.00	.....	2.00
23. Lorane Highway	15.00	15.00	.....	.....
24. Fox Hollow	6.00	.....	.....	6.00
25. Creswell, West	7.00	2.50	.....	4.50
26. Lynx Hollow	3.00	1.00	.....	2.00
27. Cottage Grove-Lorane	12.40	10.50	.....	1.90
28. London Springs	15.60	11.60	2.00	2.00
29. Mosby Creek	3.90	2.00	.....	1.90
30. Row River	19.20	15.20	1.00	3.00
31. Delight Valley	4.00	2.00	.....	2.00
32. Cloverdale	7.50	7.00	.....	0.50
33. Goshen-Pleasant Hill	14.10	13.90	.....	0.20
34. Lost Valley	4.20	4.20	.....	.....
35. Jasper, South	3.00	3.00	.....	.....
36. Springfield-Lowell	17.60	14.60	.....	3.00
37. Camp Creek	8.30	5.00	.....	3.30
38. Mohawk	17.70	16.00	.....	1.70
39. Mabel	9.00	3.50	.....	5.50
40. Harlow-Mohawk	3.00	3.00	.....	.....
41. Coburg	12.40	12.40	.....	.....
42. Game Farm	2.40	1.50	.....	0.90
43. Hill Road	4.00	3.50	.....	0.50
44. Deadwood	21.50	18.00	.....	3.50
45. Indian Creek	6.50	6.50	.....	.....
46. Siuslaw Highway	.....	.....	.....	.....
47. North Fork	13.60	11.50	1.10	1.00
48. River Road	2.80	.....	.....	2.80
49. Glenada-Ada	15.00	3.50	2.90	8.60
50. Blachly-Horton	3.00	3.00	.....	.....
Totals	436.10	347.50	18.80	69.80

[LANE]

During the last two years $377,919.41 has been spent and the following accomplished: 38.54 miles graded; 29.02 miles surfaced; major bridges costing $65,836 and maintenance costing $100,540.80.

Good progress has been made on Lane County's market roads the past two years and there remains only 16 per cent unimproved of the largest system in the state—436 miles. Most of the work has been done by county forces.

Lane County maintained 319.1 miles in 1927 at a cost of $35,839.20, or $112 per mile, and betterment cost $12,239.62. The court plans to oil several of the heaviest traveled roads out of Eugene next year to reduce maintenance costs and increase usefulness. Thirteen dangerous railroad crossings have been eliminated this biennium, which is an excellent record.

All engineering work the past nine years has been handled in good shape by P. M. Morse, County Engineer, under the direction of the County Court, Judge C. P. Barnard, Commissioners Clinton Hurd and M. H. Anderson. Ed. Tuller is Construction Superintendent and Art Stryker is Bridge Superintendent.

Territorial Market Road No. 2

Lorane South section, 2.42 miles, grade and surface, Sta. 720 at Lorane to Sta. 886 at T Bridge. Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep, crushed rock. Work by county forces; begun March, 1927; completed December, 1927. Total cost, $17,140.49: Market road funds, $5,270.46; general road funds, $4,666.99; district fund, $2,509.92; bond fund, $4,693.12.

Franklin to Highway section, 0.53 miles, grade and surface, Sta. 0 north to Sta. 28, end of market road on Siuslaw State Highway. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, 1 inch crushed gravel. Work by county forces, begun June, 1928; completed August, 1928. Total cost, $4,840.63, all market road funds. This completes No. 2 except a short section at Douglas County line.

Prairie Market Road No. 4

Eugene section, 2.65 miles, grade and surface, Sta. 0 at Eugene city limits on 6th street to Sta. 140. Roadbed width, 28 feet; surface 16 feet wide, 8 inches deep, 1 inch crushed gravel. Work by county forces; begun April, 1927; completed August, 1927. Total cost, $10,928.45: Market road funds, $1,122.06; general fund, $6,351.11; bond fund, $3,455.28.

This section eliminates a grade crossing on Southern Pacific main line and one on Oregon Electric and makes greatly improved entrance to Eugene for traffic from Prairie and Elmira districts. The Southern Pacific cooperated $10,000 and Oregon Electric $3,000, of which $6,351.11 is shown above as from general fund and balance of cooperation was used to build new connection between Prairie Road and Pacific Highway, north of terminal grounds and other connections made necessary by change in line.

High Pass Market Road No. 7

Lilly Pond section, 0.32 miles, grade and surface, Sta. 15, one mile west of junction to Sta. 32. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep, 1 inch crushed gravel. Work by county forces; begun July, 1927; completed September, 1927. Cost, $4,343.46, all market road funds.

[LANE]

Noti Market Road No. 13

Badger Mountain section, 1.38 miles, widen grade and surface, Sta. 0, four miles west of Noti postoffice to Sta. 73. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed rock. Work by county forces; begun March, 1927; completed October, 1927. Total cost, $18,630: Market road funds, $6,065.21; general road funds, $1,598.90; district fund, $10,966.57.

Lyons schoolhouse to Fowlers section, four miles, grade, Sta. 107, which is 0.65 mile west of Badger Mountain, to Sta. 320. Roadbed width, 20 feet. Work by county forces; begun March, 1928. Cost to date, $10,297.50: Market road funds, $3,043.23; district funds, $7,254.27.

Crow Vaughn Market Road No. 15

Vaughn section, 1.32 miles, Sta. 290, end of 1926, macadam, to Sta. 360 at Vaughn Sta. on Coos Bay branch of the Southern Pacific. Roadbed width, 22 feet; base surface 12 feet wide, 4 inches deep, 1½ inches crushed gravel. Work by county forces; begun May, 1927; completed September, 1927. Total cost, $9,809.64: Market road funds, $6,663.98; district funds, $3,145.66.

Crow Market Road No. 17

Christner Gap section, 3.41 miles, grade and surface, Sta. 0, six miles west of Eugene, to Sta. 180. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, 1 inch crushed gravel. Work by county forces; begun May, 1928; completed August, 1928. Total cost, $11,725.28, all market road funds.

Torkelson Market Road No. 21

Spencer Creek section, 1.70 miles, grade, Sta. 0, at east end of road westerly, to Sta. 89+58. Roadbed width, 24 feet. Work by county forces; begun July, 1928. Cost to date, $1,064.91, all general road funds.

Wolfe Creek Market Road No. 22

From the beginning of this road at Road No. 2, three miles to top of ridge were surfaced with top course of crushed rock in 1927, at cost of $10,268.42. The next section, Sta. 0 to Sta. 60, was given top course and Sta. 60 to Sta. 90, at second crossing of Panther Creek, was graded and surfaced in 1928. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed rock. Work by county forces. The 1928 costs were $10,522.07: Market road funds, $7,143.21; general road funds, $143.20; district funds, $3,235.66.

Lynx Hollow Market Road No. 26

West section, 0.65 miles, grade and surface, Sta. 140, which is 2.60 miles west of Walker, to Sta. 175, at west end of market road. Roadbed width, 23 feet; surface 12 feet wide, 8 inches deep. Work by county forces; begun May, 1927; completed December, 1927. Total cost, $2,785.31, all market road funds.

[LANE]

Lorane Market Road No. 27

East side of Mountain section, 3.5 miles, resurface. Roadbed width, 20 feet; surface 12 feet wide, 4 inches deep. Work by county forces; begun May, 1927; completed September, 1927. Cost, $11,313.65, all market road funds. When road was surfaced about 1924, a pancake one inch thick of red clay was left between base and top. Every winter the top got mushy, so the top and clay layer were scarified up and bladed out for shoulders and new top of crushed gravel placed on old base. Also, Sta. 6+70, east of Lorane, to Sta. 20, was graded 24 feet wide, and surfaced with crushed rock 16 feet wide by eight inches deep. Cost, $1,384.51, district funds.

London Market Road No. 28

Hill section, 3.82 miles, grade, Sta. 564 at London, to Sta. 766 at Douglas County line. Roadbed width, 20 feet. Work by county forces; begun July, 1928, and 2.30 miles graded to date. Cost, $15,432.21: Market road funds, $4,469.86; district funds, $10,962.35. Estimated to complete, $10,000.

Row River Market Road No. 30

Rocky Point section, 0.63 miles, grade and surface, Sta. 1+25, east, to Sta. 32+00, which is three miles west of Red Bridge. Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep, 1 inch crushed gravel. Work by county forces; begun April, 1927; completed June, 1927. Total cost, $6,371.17: Market road funds, $5,171.17; O. & S. E. R. R. cooperation funds, $1,200. This section eliminates four bad grade crossings and connects with Red Bridge section built in 1926 to the east.

Red Bridge-Disston section, 4.09 miles, grade and bridge, Sta. 189, Red Bridge east to Sta. 213 = Sta. 15, to Sta. 207 at Disston. Roadbed width 20 feet. Work by Earl McNutt, contractor, and county forces; begun September, 1928; completed to date, bridge and 1.63 miles grade. Cost, $11,259.93: Market road funds, $5,943.87; district funds, $5,316.06. Estimated to complete, $10,000. Construction of this section will eliminate two grade crossings.

Jasper South Market Road No. 35

New approaches and new deck were placed on the Jasper Bridge in 1927 by county forces. Cost, $3,660.91: Market road funds, $2,031.67; general funds, $1,629.24.

Springfield-Lowell Market Road No. 36

Fall Creek section, two miles, grade and surface, Sta. 96, east to Sta. 202, near Fall Creek station. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, 1 inch crushed gravel. Grade by Samuel & Neef, contractors, and surface by county forces. Work begun May, 1928. Cost to date, $26,601.48: Market road funds, $16,601.48; S. P. R. R. cooperation, $10,000. Three dangerous grade crossings of Cascade line and a narrow, steep grade were eliminated. This connects with Jacoby section to the west, built in 1926. During past three years the county and Southern Pacific have cooperated in eliminating all the seven grade crossings between Natron and Fall Creek, greatly improving grade and alignment at same time.

[LANE]

Mohawk Market Road No. 38

Hayden Bridge over McKenzie River was built by county forces in 1926 and 1927, at cost of $24,458.41, all market road funds. It is a 180-foot steel span, concrete floor, 171-foot timber approaches, width 18 feet. This replaces an old covered span which had served its time.

Mabel Market Road No. 39

Oshkosh-Linn County line section, 0.94 miles, grade, Sta. 116, which is 6.8 miles north of Marcola, north, to Sta. 165, at Linn County line. Roadbed width, 18 feet. Work by county forces; begun March, 1928; completed August, 1928. Total cost, $4,031.05, all district funds. This road connects with Market Road No. 17 in Linn County.

Coburg Market Road No. 41

Grade, surface and bridge, 2.75 miles, Sta. 38, at Bogart's corner, to Sta. 183, on north side McKenzie River. Roadbed width 24 feet; surface 16 feet wide, 8 inches deep, 1 inch crushed gravel, two 170-foot steel spans and 912 feet of timber trestle for approaches and flood openings. Part of grade by C. Mathews, contractor; grade and bridge by county forces. Work begun September, 1927; completed October, 1928. Cost to date, $73,735.52: Market road funds, $16,954.52; general road funds, $56,781.

This relocation saves half a mile distance between Eugene and Coburg, eliminates two railroad grade crossings for through travel and gets road out of overflow bottoms. The importance of the road and class of improvement make it the outstanding project in the county this year.

Game Farm Market Road No. 42

Grade and surface, 1.04 miles, Sta. 0, on Market Road No. 40, north, to Sta. 55. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, crushed gravel. Work by county forces; begun February, 1927; completed May, 1927. Cost, $2,591.19: Market road funds, $2,482.84; general funds, $108.35.

Armitage section, one mile, grade and surface, Sta. 0, at Armitage station north to Sta. 53, on New Coburg Road. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep, 1 inch crushed gravel. Work by county forces; begun January, 1928; completed October, 1928. Total cost, $3,745, all market road funds. This section is the first unit of a route from Springfield to New Coburg Bridge, which may become part of the proposed Cascade Highway.

Deadwood Market Road No. 44

Surface, three miles, from Mile 10, north of Siuslaw Highway, to Mile 13. Roadbed width, 11 feet; surface 8 feet wide, 8 inches deep, 1½ inches crushed rock. Work by county forces; begun June, 1928; completed September, 1928. Total cost, $5,069.23: Market road funds, $1,646.50; district funds, $3,422.73. The grading on this section was done previously by the forest service.

[LANE]

Indian Creek Market Road No. 45

Surface, 1.90 miles, from Mile 4.6 north of Rainrock to Mile 6.5 at Forks. Roadbed width, 11 feet; surface 8 feet wide, 8 inches deep. Work by county forces; begun May, 1928; completed September, 1928. Total cost, $11,271.88: Market road funds, $1,823.54; district funds, $154.13; forest reserve rentals, $9,294.21. Grading by forest service in 1926 and 1927.

North Fork Market Road No. 47

Grade and gravel base, 2.30 miles, Sta. 154, at end of Government section, to Sta. 274, at Meadows Bridge. Roadbed width, 16 feet; base 8 feet wide, 4 inches deep, bar run gravel. Work by county forces; begun May, 1928; completed September, 1928. Total cost, $12,319.35: Market road funds, $11,801.11; district funds, $518.24.

Glenada-Ada Market Road No. 49

Berrydale section, 0.40 miles, grade, and 1.20 miles surface, Mile 4.3 from Glenada to Mile 5.1 and Mile 5.3 to Mile 5.7. Roadbed width, 16 feet; surface 8 feet wide, 6 inches deep, 1½ inches crushed gravel. Work by county forces; begun June, 1928; completed August, 1928. Total cost, $3,685.46, all market road funds. Mile 4.3 to Mile 4.7 graded as Berrydale section in 1927 at cost of $2,883.35. Mile 5.3 to Mile 5.7 graded in 1925. Mile 5.1 to Mile 5.3 is planked.

Also half a mile on Canary hill graded previously, was surfaced with gravel in 1927 at cost of $1,827.53, market road funds.

Horton Market Road No. 50

Grade and surface, 0.84 miles, Sta. 78+50, north from Siuslaw Highway, to Sta. 122+61. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed rock. Work by county forces; begun June, 1927; completed October, 1927. Cost, $10,278.95: Market road funds, $2,348; general funds, $156.74; district funds, $7,774.21.

LINCOLN COUNTY

Since the beginning in 1920 a total of $236,058.80 has been made available for market roads in Lincoln County, of which $103,241.31 was from the state market road appropriation, $109,421.21 from county market road levies, and approximately $23,396.28 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. Of this total $224,546.71 has been expended and the following work accomplished: 30.46 miles graded; 21.34 miles surfaced, and maintenance during the last four years costing $7,411.17.

During the last two years $32,106.43 has been spent and 4.44 miles graded, and maintenance costing $4,327.99 performed.

The upper part of the Salmon River Market Road No. 1 is being improved by the Bureau of Public Roads with forest funds in cooperation with the Salmon River Improvement District. Below Rose Lodge the bureau location is on the south side of the river and the market road has been built on the north side. The completion of this road from Valley Junction to Otis will give a much shorter and better route from the Willamette Valley to all points along the coast in northern Lincoln County and form as well one of the best links between the Roosevelt and Pacific Highways.

The Siletz road is being pushed ahead from both ends with special taxes as this is an important road from the dairy, lumber and recreation viewpoints. There remain eight or nine miles of heavy construction and some of the road built is narrow but fair progress is being made.

Market road work the past two years has been handled by County Judge C. W. James, Commissioners Jay Dunn and Andrew Kent and County Engineers C. W. Craft and H. M. Teel.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Salmon River	9.10	7.30	1.80	.....
2. Siletz River	16.00	16.00	.....	.....
3. Yaquina River	12.00	.....	2.00	10.00
4. Spout Creek	8.00	0.50	5.00	2.50
5. Clem Road	4.20	.....	.....	4.20
Totals	49.30	23.80	8.80	16.70

Salmon Market Road No. 1

Panther Creek-Otis section, 0.98 mile grade, Sta. 83+50 west to Sta. 135 at Otis. Roadbed width, 16 feet. Grade work by Howard McMillan, contractor. Work begun June, 1927; completed August, 1927. Cost, $5,312.04, all market road funds.

The super-road district put about 1,000 cubic yards of river run gravel on this section and the next mile east in winter of 1927 at a cost of about $1,500. In March, 1928, more coarse gravel was used in the mud holes at a cost of $823. In 1928 a fill which had washed out was replaced and a top of fine gravel placed on the coarse base gravel. Cost, $1,500, market road funds.

[LINCOLN]

Siletz Market Road No. 2

Mill Creek Bridge 84-foot frame trestle 6.6 miles north of Corvallis-Newport Highway was built in 1927 at a cost of $1,635.70. Steel bridge across Siletz south of the agency was painted in 1928 at a cost of $347; a good job and very cheap.

During 1928 maintenance piles of crushed gravel from Agency to Dundon Bridge were placed at a cost of $2,082.90, market road funds.

From near Mack's Landing to Reed Creek School 2.7 miles of 12-foot grade was built in 1928 by Jack Moore, contractor. Cost, $23,592.07, district and general funds. This is beyond the designated market road but at request of County Court inspection of location and construction was made by market road department with the expectation it would become a market road in the future.

Yaquina Market Road No. 3

Eddyville-Nortons section. A contract was awarded in November, 1928, for 3.5 miles of grade from Damon's to Wagner's. This section will also require two bridges and will eliminate five grade crossings of railroad. The preliminary estimate for grade and bridge is $36,216, of which the Southern Pacific Railroad has agreed to pay $6,224 cooperation.

Spout Creek Market Road No. 4

Burnt Woods-Harlan section, 3.54 miles grade from Sta. 125 about 2.5 miles south of Burnt Woods south to Sta. 312. Roadbed width, 12 feet. The first half mile was rough graded in 1927 by county forces and in 1928, Yunker Wiecks Co., contractors, completed this and three miles of lighter work. Work begun July, 1927; completed September 15, 1928. Total cost, $14,478.19. Expended 1927, $6,899.97; expended 1928, $7,578.22.

LINN COUNTY

Since the beginning in 1920 a total of $838,415.36 has been made available for market roads in Linn County, of which $407,297.65 was from the state market road appropriation, $395,078.90 from county market road levies, and approximately $36,038.81 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this total $841,655.61 has been expended and the following work accomplished: 148.36 miles graded; 143.90 miles surfaced; and maintenance during the last four years costing $28,598.04; and cooperation on state highway construction to the extent of $52,350.

During the last two years $179,293.35 has been spent and the following accomplished: 22.83 miles graded; 21.10 miles surfaced; 13.10 miles treated with oil; and maintenance costing $15,126.28.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Albany-Corvallis	9.40	7.40	1.00	1.00
2. Corvallis, South	27.00	25.00	.....	2.00
3. Halsey-Sweet Home	26.80	23.00	.....	3.80
4. Green's Bridge-Scio-Lyons	21.30	11.30	4.00	6.00
5. Munkers-Stayton-Weasel Flat	16.00	4.00	.....	12.00
6. Mehama-Mill City	8.10	.....	8.10	.....
7. Knox Butte-Scio	15.70	13.00	.....	2.70
8. Santiam-Bottoms	2.60	2.60	.....	.....
9. Albany-Spicer	9.30	8.30	.....	1.00
10. Lebanon-Sand Ridge	7.80	6.10	.....	1.70
11. Brownsville-Orleans	20.10	17.10	.....	3.00
12. Bell Plain-Verdure	6.40	6.40	.....	.....
13. Fayetteville-Boston Mill, North	13.80	6.00	.....	7.80
14. Harrisburg-Diamond Hill	7.80	4.30	.....	3.50
15. Diamond Hill, South	4.40	4.40	.....	.....
16. Alford, South	7.60	7.60	.....	.....
17. Brush Creek	6.40	1.00	.....	5.40
18. Lebanon-Rock Hill	8.50	4.50	.....	4.00
19. Plainview East Ann' West	5.20	4.20	.....	1.00
20. Lacomb-Brewster-Berlin	19.70	9.00	.....	10.70
21. Plainview, South	3.80	.....	.....	3.80
22. Tangent-Lebanon	9.70	6.70	.....	3.00
23. Lake Creek School-Brownsville	10.50	8.50	.....	2.00
24. Crabtree-Brewster	6.20	4.20	.....	2.00
25. Arnold School-Crabtree	8.10	7.00	.....	1.10
26. Linn, West	4.40	2.40	.....	2.00
27. Glasser-Fleinow School	5.90	5.90	.....	.....
28. Gilkey-West Scio	2.90	.....	.....	2.90
29. Brandon School	1.00	1.00	.....	.....
30. Santiam Highway	.....	.....	.....	.....
Totals	296.40	200.90	13.10	82.40

Linn County has next to the largest market road system in the state and has made good progress the past two years towards its completion. During 1928, 15 miles were surfaced with macadam and at this rate the system will be complete in five years. All grading and bridges and most of the surfacing have been done by county forces and the work has been well done at reasonable cost.

[LINN]

Maintenance has been of a high standard in Linn County on market roads. Proper equipment and constant attention have aided in this result. The cost in 1927 for 87 miles was $10,597.81, or $122 per mile. The county plans additional oil treatment on heavy traveled roads as results obtained were very satisfactory.

The engineering work has been handled by Chas. H. Leonard, County Engineer, the past four years under the direction of the County Court, Judge B. M. Payne, and Joseph Hume and H. A. Renninger, County Commissioners.

Albany-Corvallis Market Road No. 1

Corvallis-East section, one mile grade and surface, Sta. 0, at Oregon Electric Depot, to Sta. 52, at north end of Market Road No. 2. Roadbed width, 24 feet; base surface 20 feet, six inches deep, gravel treated with light oil. Will give heavy oil treatment in 1929. Concrete riprap protection for fills cost $2,380. Work by county forces; begun April, 1928. Total cost to November 1, $9,810.04, market road funds.

Corvallis-South Market Road No. 2

North section, 0.28 mile grade and surface from Sta. 0, one mile east of Corvallis, south to Sta. 15. Roadbed width, 24 feet; surface 20 feet wide, six inches deep, gravel treated with light oil. Work by county forces; begun April, 1928. Cost, $1,700.56, market road funds.

Halsey-Sweet Home Market Road No. 3

Brownsville-West section, 3.26 miles, grade and surface from Sta. 0, which is 212 feet inside the city limits of Brownsville, west to Sta. 172, which is two and one-half miles east of Halsey. Roadbed width, 26 feet; surface 20 feet wide, nine inches deep, crushed gravel. Work by county forces; begun July, 1926; completed October, 1927. Cost, $24,248.16, market road funds. Expended in 1926, $13,410.71; expended in 1927, $10,837.45. An 80-foot right of way and improved alignment was secured and heavy macadam constructed, as this road will be paved or treated with oil. Several timber trestles on yew piling were built.

Sweet Home-South section, 2.96 miles grade and base surface, Sta. 0, on Santiam Highway at Sweet Home, south to Sta. 236+44.5, near Matlock place. Roadbed width, 24 feet; surface 18 feet wide, six inches deep, crushed gravel. Work by county forces; begun June, 1928. cost to November 1, $23,843.31, market road funds. Good job with easy curves and grade on this section replaces steep Rowell hill.

Tulsa-Halsey section, 1.55 miles grade and surface from Sta. 202, east through Halsey, to Sta. 284, which is 700 feet east of the Pacific Highway. Roadbed width, 24 feet; surface 18 feet wide, seven inches deep, screened pit gravel. Work by county forces; begun August, 1928; completed November, 1928. Cost, $7,014.66, market road funds. Permission was obtained from farmers to remove fences and secure fill needed by cutting back gentle slope from ditch into fields. This cleared the fence row, gave better drainage to fields, made ditches free from crumbling banks and provided the dirt to raise grade without purchasing of new right of way.

[LINN]

Green's Bridge-Scio-Lyons Market Road No. 4

Munkers-Scio section, 2.46 miles oil macadam, Sta. 0, at Munkers station, east to Sta. 130 at corner one mile northwest of Scio; also the oil treatment was extended through Scio 1.5 miles. Roadbed width, 24 feet; oil surface 18 feet wide. Work by county forces; begun February, 1928; completed September, 1928. Cost, $7,160.80: Market road funds, $5,133.80; general and district funds, $1,677; city of Scio, $350. West Scio, Sta. 58 to Sta. 66 was graded on new line and surfaced with crushed gravel. Sta. 66 to Sta. 130 had a high crown and was shaped up in the spring of 1928. Sta. 0 to Sta. 57 was first-class macadam built in 1925. The whole four miles were given a light oil treatment in June and 85 to 90 per cent oil in August followed by clean screenings. The oil treatment and screenings cost $4,799.49, or $1,200 per mile. Several timber bridges were built. The west section has required least patching and looks the best, though both are entering the winter in good shape.

The east approach to Green's Bridge was repaired and break in grade at end of span eliminated by raising bents to vertical curves.

Munker-Stayton-Weasel Flat Market Road No. 5

Shelburn-Stayton section, 3.23 miles grade and base surface from Sta. 0, one-quarter mile east of Shelburn, east and north to Sta. 170+49. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, gravel. Work by county forces; begun June, 1928. Cost to November 1, $6,446.61, market road funds.

Lyons-Mill City Market Road No. 6

Entire road, 8.1 miles oil macadam from Mehama Bridge to Mill City Bridge. This was an old road with heavy gravel macadam surface well maintained. In the fall of 1926 the district voted special tax for oil and in 1927 it was treated 18 feet wide with light oil in May and heavy oil in August followed with screenings. Cost, $7,893.43: Market road funds, $1,698.22; special district tax, $6,000.

Cost of Oiling Mehama to Mill City—8.1 Miles

First Oiling May, 1927

716.6 bbl. road oil 55 per cent asphalt put on at $2.55 per bbl.	$1,827.33
2,005 gal. of gasco No. 1 for patching	230.50
25 cu. yds. of crushed gravel for patching	25.00
Rental of broom from State Highway Department	134.00
Labor for sweeping, patching, etc.	381.24
85,400 sq. yds. first oil at $0.032 per sq. yd.	$2,598.07

Second Oiling August, 1927

673.5 bbls. road oil 80 per cent to 90 per cent asphalt (tested 87 per cent to 90 per cent) at $2.48½ per bbl.	1,673.59
1,401 cu. yds. of screenings	1,401.00
Loading gravel with crane	223.54
Hauling screenings on road	1,104.03
Heating asphalt	313.00
Rental of oiler from State Highway Department and repairs	529.07
Blading, flagman, etc.	229.68
Total	$5,473.91
Credit for oil on hand, etc.	178.55
85,400 sq. yds. second oiling at $0.062 per sq. yd.	$5,295.36
Total cost two coats at $0.094 per sq. yd.	$7,893.43
Cost per mile	974.00

[LINN]

A first-class job was secured and maintained all winter. The residents were well pleased and voted another special tax to reoil. This was done in 1928 at a cost of $6,286.96, of which the district paid $5,000. Linn County has been quite successful with oil macadam due to the selection of sections having proper strength macadam to start with and the careful attention to details of construction and maintenance by the County Engineer.

Menis Creek section, 0.14 mile grade and bridge, Sta. 251, about five miles east of Lyons, to Sta. 259. Roadbed width, 24 feet; surface 20 feet wide, eight inches deep, crushed gravel. Work by county forces in 1927. Cost, $2,657.06.

Fayetteville-Boston Mills and North Market Road No. 13

Grade and surface 2.97 miles, Sta. 0, two miles west of Plainview, northwest to Sta. 156+88. Roadbed width, 20 feet; surface 14 feet wide, six inches deep, crushed rock. Work by county forces; begun April, 1926; completed September, 1927. Cost, $11,172.82, market road funds. Expended 1926, $2,554.13; expended 1927, $8,918.69.

Boston Mill section, 4.07 miles grade and surface and bridges from Sta. 0, which is two and one-half miles west of Plainview, south and west to Sta. 215+03, on Pacific Highway at Shedd. Roadbed width, 24 feet; surface 18 feet wide, seven inches deep, crushed rock. Work by county forces; begun May, 1928; completed November, 1928. Cost, $30,375.80, market road funds, of which $836.81 was for clearing, $261.12 culverts, $8,078.10 grading, $7,219.24 bridges, $13,740.77 for surface, $75.62 for right of way and $164.14 for engineering.

Diamond Hill Market Road No. 15

Diamond Hill-South section, 4.42 miles grade and surface, Sta. 0, at north end of road south to Sta. 233+29.7. Roadbed width, 18 and 24 feet; surface 12 feet wide, nine inches deep, crushed rock. Work by county forces; begun January, 1925; completed November, 1928. Cost, $21,397.43: Market road funds, $20,473.97; general road funds, $923.46. Expended 1925, $16,542.02; expended 1926, $923.46; expended 1928, $3,931.93.

Brush Creek Market Road No. 17

A short section, 0.19 mile grade, surface and bridges about one-quarter mile south of the Brownsville-Holley road. Bridges, two 19-foot and one 23-foot timber bents, yew piling. Roadbed width, 20 feet; surface eight feet wide, eight inches deep, gravel. Work by county forces in 1927. Cost, $1,641.49.

Lebanon-Rock Hill Market Road No. 18

Grade and surface 4.77 miles, Sta. 0, near Rock Hill school, south and west to Sta. 252+40 on Market Road No. 21, north of Brownsville. Roadbed width, 20 feet; surface 14 feet wide, eight inches deep, crushed rock. Work by county forces; begun January, 1925; completed September, 1928. Cost, $21,671.43, market road funds. Expended in 1925, $15,024.46; expended in 1928, $6,646.97.

[LINN]

Lacomb-Lebanon Market Road No. 20

Bridges at 2.6 and 5.0 miles from Lacomb, 57 feet of timber trestle. Built by county forces in July, 1928. Cost, $2,092.01: District funds, $700; bridge funds, $1,392.01.

Crabtree-Brewster Market Road No. 24

Bridge at 1.9 miles from Crabtree, 57-foot timber trestle built in July, 1928, by county forces. Cost, $783.25: District funds, $150; bridge funds, $633.25.

Linn Station West Market Road No. 26

Grade and surface 2.41 miles and pile bridge across Calapooia River, Sta. 0, on Pacific Highway, east to Sta. 1927 across Calapooia. Roadbed width, 20 feet; surface 14 feet wide, nine inches deep, screened pit gravel. Work by county forces; begun July, 1928; completed October, 1928. Cost, $13,290.62, market road funds. Expended in 1927, $11,912.85; expended in 1928, $1,377.77.

COST OF LINN COUNTY MARKET ROAD BRIDGES FOR THE YEAR OF 1928

Bridge Number	Description	Length	Cost	Cost per lin. ft.
M 2–12.5	7–19′ spans, 18′ roadway 4x6 T&G deck, on cedar piling, plans No. 3064	133′	$ 1,257.61	$ 9.45
M 3– 4.1	1–8′ span, 18′ roadway, 2x6 deck, on cedar posts 6′ long	8′	91.50	11.78
M 3– 4.3	1–15′ span, 18′ roadway 4x6 sized deck, on 8 cedar posts 6′ long	15′	154.12	10.27
M 3– 5.0	1–15′ span, 18′ roadway, 4x6 sized deck, on 8 cedar posts 6′ long	15′	154.17	10.27
M 4– 2.9	1–19′ span, on Yew posts and concrete walls, 4″ laminated deck, 20′ roadway	19′	272.34	15.13
M 4– 5.4	1–19′ span, 20′ roadway, 4″ deck, on 8 yew posts 8′ long	19′	288.76	15.20
M 4– 5.6	1–19′ span, 4″ laminated deck, 20′ roadway, on 8 yew posts 8′ long	19′	299.08	15.75
M 5– 3.8	1–15′ span, 18′ roadway, 4x12 T&G deck, on 8 cedar posts 6′ long	15′	209.94	13.99
M 5– 4.1	3–19′ spans, 18′ roadway, 4x12 T&G deck, on 16 cedar posts 6′ long	57′	528.17	9.27
M 13– 5.4	15–19′ spans, 18′ roadway, 4″ laminated deck on Port Orford cedar piling plans No. 3064	285′	2,664.16	9.34
M 13– 6.5	2–19′ spans, 18′ roadway, 4″ laminated deck, class B load, plans No. 3064 on Port Orford cedar piling	38′	487.01	12.81
M 13– 6.6	3–19′ spans, 18′ roadway, 4″ laminated deck, plans No. 3064, on Port Orford cedar piling	57′	574.86	10.08
M 13– 6.7	2–19′ spans, 18′ roadway, 4″ laminated deck, on Port Orford cedar piling	38′	462.82	12.17
M 13– 7.5	5–19′ spans, 18′ roadway, 4″ laminated deck, plans No. 3064, on Port Orford cedar piling	95′	1,011.54	10.64
M 13– 8.4	6–19′ spans, 18′ roadway, 4″ laminated deck, plans No. 3064, on Port Orford cedar piling	114′	1,102.47	9.67
M 13– 8.45	3–19′ spans, 18′ roadway, 4″ laminated deck, plans No. 3064, on Port Orford cedar piling	57′	618.47	10.58
M 13– 8.9	1–19′ span, 18′ roadway, 4″ laminated deck, plans No. 3064, on Port Orford cedar piling	19′	297.91	15.66
M 15– 0.9	1–25′ span, on 60° angle 4x6 deck, 18′ roadway, concrete foundation under sills	25′	362.39	14.49
M 18– 8.7	2–13′ spans, 18′ roadway, 4″ laminated deck, plans No. 3064, on cedar piling	26′	426.09	16.15
M 20– 2.6	3–19′ spans, 18′ roadway, 4″x12″ shiplap deck, on 12–20′ piling and 4–16′ piling	57′	587.87	10.30
M 20– 5.0	5–19′ spans, 18′ roadway, 4x12 T&G deck, on cedar piling	95′	804.14	8.46
M 24– 1.9	3–19′ spans, 18′ roadway, 4x6 T&G deck, on cedar piling	57′	633.25	11.64
	Total	1,263′	$13,288.67	
	Average cost			$ 10.50

[LINN]

Glasser-Fleinow School Market Road No. 27

Unit D section, 4.22 miles grade and surface, Sta. 59+79, half mile west of Glasser station, to Sta. 270+88, west end of road on No. 13. Roadbed width, 20 feet; surface 14 feet wide, crushed rock. Work by county forces; begun May, 1926; completed November, 1927. Cost, $17,715.99, market road funds. Expended in 1926, $9,525.24; expended in 1927, $8,190.75.

MALHEUR COUNTY

Since the beginning in 1920 a total of $364,972.92 has been made available for market roads in Malheur County, of which $188,847.34 was from the state market road appropriation, $174,223.60 from county market road levies, and approximately $1,901.98 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this total $329,153.84 has been expended and the following work accomplished: 70.29 miles graded; 28.54 miles surfaced; maintenance during the last four years costing $16,645.23; and cooperation on state highway construction to the extent of $64,143.

During the last two years $51,640.42 has been spent and the following accomplished: 13.31 miles graded; 8.48 miles surfaced; maintenance costing $12,084.67 and cooperation on state highway construction to the extent of $10,000.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Nyssa-Jordan Valley	74.60	32.00	14.10	28.50
2. Juntura-Drewsey-Burns (Highway)	.....	.....	.....	.....
3. Homedale Spur	1.90	.....	1.90	.....
Totals	76.50	32.00	16.00	28.50

During the past nine years most of Malheur County's market road funds, and in addition a county bond issue of $100,000, has been spent on the Jordan Valley Market Road. The road from Nyssa to Jordan Valley is 75 miles in length and considering the high prices prevailing, good progress in its improvement was made until 1925, since then over two years market road receipts have been expended as cooperation on state highway construction and market road work correspondingly delayed. The Jordan Valley Irrigation project has been having difficulties, the stock business has been at a low ebb, banks have failed, delinquent taxes are increasing, and generally the importance of the Jordan Valley area has decreased in a traffic sense. The completion of the Owyhee Dam will open up considerable new territory, new settlers will require new roads and it will no doubt be considered that the Jordan Valley project has had its share of the market road funds. For this reason lower standards have been adopted, using grader construction and local surfacing material and every effort made to complete the road, making it available for all-year travel as soon as possible.

Most construction work the last two years has been done by county forces.

Maintenance has been handled by a permanent patrol supplied with a truck and blade. This is a movable outfit and they camp wherever they work. In addition to blading and such work they add surfacing material in places needing it. While the cost of this runs into a sizeable total for the year, they maintain nearly 80 miles and add some surfacing. This maintenance crew and the small construction crew have been efficient and have done the work cheaply.

[MALHEUR]

The work has been under direction of the County Court, H. Lee Noe, Judge, J. D. Fairman and Frank Morgan, Commissioners. During the early part of 1927, J. F. Miller was County Engineer and Roadmaster and since that time H. Tamblyn has served in that capacity.

Nyssa-Jordan Valley Market Road No. 1

Nyssa-Adrian section, 3.96 miles of grading, beginning at Sta. 217, which is 4.10 miles from the junction with the John Day Highway at Nyssa, to Sta. 421. Roadbed 24 feet in width, Grading by county forces; started in April, 1927; completed July, 1927. Cost, $7,770.25, all market road funds.

Nyssa-Adrian section, 3.96 miles of surfacing, beginning at Sta. 217, which is 4.10 miles from the junction with the John Day Highway at Nyssa, to Sta. 417. Surfaced 16 feet wide and eight inches deep with 1-inch-minus screened gravel. Arthur Johnson, contractor, started work in July, 1927, and completed the job in October, 1927. Cost, $11,408.53.

Nyssa-Jordan Valley section (Ward Lane) 1.2 miles of resurfacing work done in 1926. Surfaced 16 feet wide by four inches deep by Arthur Johnson, contractor. Work begun July, 1927, and completed in October, 1927. Sta. 69, which is 1.30 miles from the junction with the John Day Highway at Nyssa, to Sta. 132. Cost, $1,350, all market road funds.

Mulloy's Ranch north, 1.52 miles of grading and surfacing. Sta. 1000 to Sta. 1012 at Mulloy's Ranch to Sta. 1080. Roadbed 16 feet wide, pit run gravel; surface 10 feet wide by eight inches deep. Work done by county forces from May, 1928, to July, 1928. Cost, $2,900.77, market road funds. Sta. 1000 to Sta. 1012 was resurfaced. From Mulloy's Ranch at Sta. 1012 to Sta. 1080 the road crosses a summit, maximum grades being used on both sides. The soil is "dobe" and the road has always been impassable when wet.

Sucker Creek Summit south, 1.65 miles of grading from Sta. 1787 at the summit at the end of the 1925 grading contract to Sta. 1700 at the foot of the hill. Work done by a county tractor and blade outfit in June, 1928, at a cost of $90.95, market road funds. No grading was done south of the summit in 1925, but the old road was used. Grades were up to 15 per cent and when road was wet these grades bothered traffic. A new road was graded with grades not exceeding 5 per cent.

Hooker Creek to Mulloy's Ranch to summit, three miles of surfacing and four miles of resurfacing. Beginning at Hooker Creek at Sta. 255, which is 4.72 miles north of Jordan Valley, to Sta. 381, surfaced and resurfacing Sta. 429 to Sta. 455 and Sta. 482 to Sta. 537 and Sta. 571 at Knight's Ranch to Sta. 692, and surfacing Sta. 1290, which is 5.27 miles north of Mulloy's Ranch, to Sta. 1330. Local materials consisting of sand, gravel, shale, etc., which could be put on cheaply without crushing, were used. Surface about 10 feet wide and depth depending on conditions, usually four inches or eight inches. Work was started by county forces in August, 1928, and had not been completed at this time but $6,514.16 of market road funds has been expended.

[MALHEUR]

Nyssa-Adrian section, from Sta. 421, which is eight miles from the junction with the John Day Highway at Nyssa, to Sta. 611 at Adrian, 4.2 miles. Widening and ditching with tractor and blade outfit and some fills widened with teams. Cost, $368.34, market road funds.

Adrian-Homedale Spur section, from Sta. 3165+00, which is two and one-half miles south of Adrian, to Sta. 2838+96.1 at Homedale Spur. In 1926 this section of the Joyce survey was retraced and right of way acquired. In 1928, as this section comes under the Owyhee Irrigation Project, it was decided to open up the entire section with a tractor and blade outfit so that traffic could use the road. This marks the road so that, in constructing irrigation ditches, the irrigation district will put in culverts and bridges, and purchasers of land will be certain to know of the existence of a county road right of way. County forces started work in April, 1928, and finished in May, 1928. Roadbed 16 feet wide. Cost, $471.29, market road funds. Owing to the dry condition of the soil, the materal would not pack and only part of the work contemplated was done. This road can be bladed and maintained, and when settled will be much better than the old road. The length of this section is 6.18 miles.

MARION COUNTY

Since the beginning in 1920 a total of $2,018,140.56 has been made available for market roads in Marion County, of which $569,896.75 was from the state market road appropriation, $628,492.77 from county market road levies, and approximately $819,751.04 from cooperative funds such as bonds, district specials, motor license funds, O. & C. funds, general funds, etc. Of this total $1,923,861.87 has been expended and the following work accomplished: 188.54 miles graded; 111.06 miles surfaced; 91.33 miles paved; major bridges costing $69,697; and maintenance during the last four years costing $44,514.54.

During the last two years $675,432.28 has been spent and the following accomplished: 87.75 miles graded; 86.63 miles surfaced; 13.71 miles paved; major bridges costing $43,738; maintenance costing $36,005.37.

During the four years from 1925 to 1928, inclusive, Marion County has finished the 165 miles laid off as a five-year program and early in 1929 will designate additions to the market road system of the county. Harmony, proper equipment, study and solution of engineering and construction problems and good organization have aided this favorable progress as much as adequate funds. The policy the past two years has been to improve first with macadam surface, although 13.6 miles of bituminous pavement were laid in 1928. Many sharp corners previously paved have been cut back to 28-degree curves. Most of the work has been done by county forces. The cost of grade and macadam has averaged $5,000 per mile and pavement $9,111 per mile. Pavement was 16 feet wide and four inches thick. The county has purchased several one-man patrol graders and have established the plan of blading all rock and gravel macadam once a week and improved riding qualities have been apparent the past year. Maintenance has been very light on black pavement and service rendered quite satisfactory. Oil treatment has not worked out very good and no additional work of this character is planned.

All engineering and construction has been handled by W. J. Culver, County Roadmaster and Engineer, assisted by W. S. Swart and J. F. McGee, Assistant Engineers, and Frank Johnson, Assistant Roadmaster. The County Court directing the work for the past two years has consisted of County Judges J. T. Hunt and J. C. Siegmund, and Commissioners J. E. Smith and J. H. Porter.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Paved with Bituminous Pavement	Surfaced with Rock or Gravel	Not Graded to Market Road Standards
1. Jefferson-Greens Bridge	2.36	2.36	.....	.....
2. Sidney	2.28	2.28	.....	.....
3. Turner-Marion	7.20	1.20	6.00	.....
4. Brooks-Pacific Highway	0.30	0.30	.....	.....
5. Gervais-Pacific Highway	0.50	0.50	.....	.....
6. Matheny Ferry Road	3.35	3.35	.....	.....
7. Gervais-St. Louis	1.89	1.89	.....	.....
8. Hubbard-Broadacres	2.83	2.83	.....	.....
9. Hubbard-Needy	2.50	2.50	.....	.....
10. Aurora-Donald	4.75	4.75	.....	.....
11. Aurora-East Butteville	3.30	.....	3.30	.....

[MARION]

Number and Name	Length in Miles	Classification as to Improvement		
		Paved with Bituminous Pavement	Surfaced with Rock or Gravel	Not Graded to Market Road Standards
12. Yergen Corner-Newberg	4.65	.....	4.65	.....
13. St. Paul-Newberg	6.12	6.12	.....	.....
14. Woodburn-St. Paul	9.80	9.80	.....	.....
15. Monitor-Woodburn	2.10	2.10	.....	.....
16. Mt. Angel-Woodburn	6.44	6.44	.....	.....
17. Mt Angel-Scotts Mills	6.47	6.47	.....	.....
18. Mt. Angel-Bethany	3.65	3.65	.....	.....
19. Salem-Livesley	2.90	2.90	.....	.....
20. Salem-Rosedale	3.94	3.94	.....	.....
21. Salem-Pratum	6.67	6.67	.....	.....
22. Salem-Geer	4.90	4.50	0.40	.....
23. Salem-Whittaker	11.30	11.30	.....	.....
24. Salem-Wheatland	6.47	6.47	.....	.....
25. Feeble Minded Inst. Road	2.09	2.09	.....	.....
26. Salem-Silverton	12.44	12.44	.....	.....
27. Salem-Turner	7.90	7.90	.....	.....
28. Turner-Aumsville	4.20	4.20	.....	.....
29. Aumsville-Sublimity	4.10	4.10	.....	.....
30. Sublimity-Stayton	1.50	1.50	.....	.....
31. Stayton-Mehama	8.64	8.64	.....	.....
32. Stayton-West Stayton	3.20	2.00	1.20	.....
33. Silverton-Pine Tree Corners	4.34	4.34	.....	.....
34. Silverton-Willard	4.50	2.16	.....	2.34
35. Jefferson-Marion	4.70	.....	4.70	.....
36. Salem-Fairfield-St. Paul	15.70	0.80	14.90	.....
37. Highway at Brooks to Labish	1.44	1.14	0.30	.....
38. Woodburn, South to Highway	1.47	1.47	.....	.....
39. Jefferson-Talbot	5.30	.....	5.30	.....
40. West Stayton-Aumsville	4.38	.....	4.38	.....
41. Turner-Pacific Highway	4.20	.....	4.20	.....
42. Sublimity-Willard	8.26	2.30	5.76	0.20
43. Whittaker-Drift Creek Falls	7.52	1.80	5.72	.....
44. Pratum-Willard	4.40	.....	4.40	.....
45. Silverton-Hadley Ranch	6.05	1.00	5.05	.....
46. Silverton-Skaifes Ranch	3.00	.....	2.55	0.45
47. Silverton-Central Howell	4.10	4.10	.....	.....
48. Pine Tree Corners-Jack Br.	0.55	.....	0.55	.....
49. Mt. Angel-North Howell	3.75	.....	3.75	.....
50. North Howell-Lake Labish	1.05	.....	1.05	.....
51. Gervais-Parkersville-Simmons	7.84	.....	7.84	.....
52. Chemawa-Hazelgreen	3.00	.....	3.00	.....
53. Livesley-Halls Ferry	2.41	.....	2.41	.....
54. Rosedale-Fairview	2.96	.....	2.96	.....
55. Liberty-Skyline	1.60	1.60	.....	.....
56. Industrial Schools Road	3.80	3.00	0.80	.....
57. Woodburn-Reform School Road	1.00	.....	1.00	.....
58. Hubbard-Boones Ferry Road	0.70	.....	0.70	.....
59. Aurora-County Line	1.86	.....	1.86	.....
60. East Butteville-Cemetery Corners	1.25	.....	1.25	.....
61. Donald-Yergens Corner	2.14	.....	2.14	.....
62. Champoeg-Monument Park	0.72	.....	0.72	.....
63. Spong Road	2.01	.....	2.01	.....
64. Salem-Fruitland	3.40	0.80	2.60	.....
65. West Woodburn-Broadacres	2.72	.....	2.72	.....
66. Stayton-Santiam Bridge	0.50	.....	0.50	.....
67. West Stayton-West	2.00	.....	2.00	.....
68. Aral Corner-Bressel Corner	3.90	.....	3.90	.....
Total	279.26	159.70	116.57	2.99

Turner-Marion Market Road No. 3

Turner-Marion section, 1.65 miles, grade and surface, from Sta. 53, which is one and one-half miles southeast of Turner, to Sta. 140 at Crawford School. Roadbed, 24 feet wide; surfaced 18 feet wide, five inches

[MARION]

deep, with 1¼-inch crushed gravel. The grading consisted of reshaping the old grade. The project included one 15-foot and one 19-foot span timber bridges constructed to state plans. Work begun September 1, 1926, by county forces and completed December 1, 1927. Total cost, $5,710.27. Expended in 1926, $4,960.27; and in 1927, $750.

Grading and surfacing of the next section, 2.58 miles in length, extending from Sta. 140, which is at Crawford School, to Sta. 276, which is two miles northeast of Marion, was completed in 1927. Roadbed width, 24 feet; surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel. Grading consisted of reshaping old grade with improvements in grade and alignment. Work by county forces; completed December 1, 1927. Cost, $8,163.23.

The last section, 1.82 miles grade and surface from Sta. 276 south to Sta. 372 at Marion, was constructed in 1928. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, 1¼-inch crushed gravel. Work by county forces; completed December, 1928. Cost to November 1, $5,082.27. Estimated total cost, $9,682.

Aurora-East Butteville Market Road No. 11

The whole road, 3.25 miles, was graded and surfaced from Sta. 0, which is one mile west of Aurora, to Sta. 171+48 at East Butteville. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, 1¼-inch crushed gravel. Work by county forces; begun August 1, 1928; completed in December, 1928. Cost to November 1, $9,823.21. Estimated total cost, $12,160.

Yergen Corner-Newberg Market Road No. 12

Marion and Yamhill Counties cooperated equally in the repair and improvement of the bridge over the Willamette River at Newberg. The length of the old bridge was shortened 655 feet at the south end where a fill was made, requiring 4,896.5 cubic yards of embankment. The approaches were rebuilt and the steel span reinforced. The grading was contracted to Earl L. McNutt and the bridge contracted to the Clackamas Construction Company. The work was begun June 1, 1927, and was completed December 15, 1927, at a cost of $15,848.41 to Marion County for her half of the cost.

Yergen's Corner to pavement section, 4.65 miles grade and surface, Sta. 0 at Yergen's corner to Sta. 258 on pavement two miles south of Newberg Bridge which completes this road. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, 1¼-inch crushed gravel base, ¾-inch top. Work by county forces; begun July, 1928; completed December, 1928. Cost to November 1, $23,358.37. Estimated total cost, $30,200.

Mt. Angel-Bethany Market Road No. 18

An 80-foot steel span with 60-foot trestle approaches over the Abiqua River at Sta. 100+50, which is two miles south of Mt. Angel, was built. Plans for the bridge were prepared by the State Highway Department. Engineering supervision was by County Engineer. Work begun October 1, 1926, under contract to Clackamas Construction Company and completed January 10, 1927. Total cost, $8,731.48. Expended in 1926, $7,851.52; and in 1927, $879.96.

[MARION]

Salem-Whiteaker Market Road No. 23

A section, 0.63 mile long, from Sta. 560, which is one and one-half miles east of Shaw to Sta. 593+58, the east end of No. 23 and beginning of No. 43, was paved 16 feet wide, four inches deep with bituminous concrete. Work by county forces; begun July, 1928; completed October, 1928. Cost, $5,514.25, which completes this road.

Stayton-Mehama Market Road No. 31

Paving of a short section 0.15 mile in length, from Sta. 317+50, to Sta. 325+15, which are on either side of Stout Creek Bridge one and one-half miles west of Mehama, was completed. The section was regraded in 1926 and heavy approach fills constructed which were left to settle when the rest of the road was paved in 1926. Bituminous pavement 16 feet wide and three inches thick was laid. Work begun September, 1927, by county forces and completed November 1, 1927. Total cost, $3,817.68.

Jefferson-Marion Market Road No. 35

Grading and surfacing of entire road four and one-half miles in length, from Sta. 0, at Marion, to Sta. 237, at Jefferson, was completed. Roadbed width, 24 feet, surfaced 18 feet wide, five inches deep with 1½-inch crushed gravel base and ¾-inch top. The project included an overhead crossing structure on the main line tracks of the Southern Pacific which was reported separately in 1926. There were timber trestle bridges as follows: One 61-foot, one 57-foot and two 19-foot, all constructed to state plans. Work begun May 1, 1926, by county forces and completed December 1, 1927. Total cost, $26,435. Expended in 1926, $24,752.76; in 1927, $1,682.24.

Salem-St. Paul Market Road No. 36

Grading and surfacing of a section 2.92 miles in length, from Sta. 260 at Waconda, to Sta. 414, at Aral Corner, was completed. Graded 24 feet wide, surfaced 18 feet wide and five inches deep with 1¼-inch crushed gravel base and ¾-inch top. Grading work consisted of reshaping old road. Work begun May 16, 1927, by county forces and completed December 1, 1927. Cost, $9,988.

Aral Corner-St. Paul section, 5.15 miles grade and surface from Sta. 414 at Aral Corner to Sta. 683+50 about 2.6 miles south of St. Paul. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, 1¼-inch crushed gravel base and ¾-inch top. Work begun June 1, 1928, and finished in November, 1928, by county forces. Cost to November 1, $17,165.65. Estimated total cost, $21,593. The rest of this road to St. Paul is a good gravel road.

In 1926 a three-mile section beginning at the south end of the road, which is four miles north of Salem, was oiled with light oil and again in 1927 with heavy oil but the first 0.80 mile could not be held as an oiled macadam and was covered with bituminous pavement in 1928. Work started at Sta. 0 at junction with Road No. 24 and extended north to Sta. 43. Paved 16 feet wide and from two to six inches deep, by county forces. Cost, $5,707.65.

[MARION]

Jefferson-Talbot Market Road No. 39

Grading and surfacing, 5.30 miles from Sta. 0, which is on the Pacific Highway near Jefferson, to Sta. 280, which is at Talbot, was completed. Graded 24 feet wide, and surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base, ¾-inch top. Work begun June 1, 1927, by county forces and completed December 1, 1927. Total cost, $20,887.64.

West Stayton-Aumsville Market Road No. 40

Grading and surfacing 2.12 miles from Sta. 0, at junction with the Turner-Aumsville road, to Sta. 112, which is two miles south, was completed. Graded 24 feet wide and surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base, ¾-inch top. Grading work consisted of reshaping old grade with improvements in grade and alignment. Work begun August 1, 1926, by county forces and completed December 1, 1927. Total cost, $6,530.05. Expended in 1926, $5,780.05; in 1927, $750.

Grading and surfacing 2.25 miles from Sta. 112, which is two miles south of Aumsville, to Sta. 231, at West Stayton, was completed. Graded 24 feet wide; surfaced 18 feet wide, five inches deep, with 1½-inch crushed gravel base, ¾-inch top. The project included two 19-foot wood spans. Work begun June 1, 1927, by county forces and completed December 1, 1927. Cost, $7,328.49. which finishes this road.

Turner-Pacific Highway Market Road No. 41

Grading and surfacing of two sections 3.23 miles in length were completed. The section extending west from Sta. 90 to Sta. 223, which is at the junction with the Pacific Highway, and the section extending from Sta. 0, which is in Turner, to Sta. 37+20, which is at the city limits of Turner and which equals Sta. 0+00 of the section extending from Turner to the Pacific Highway, were graded 24 feet wide, and surfaced 18 feet wide and five inches deep with 1¼-inch crushed gravel. There was some new alignment with quite heavy grading. Work was begun May 1, 1927, by county forces and was completed December 1, 1927, at a total cost of $15,226.36. The section from the city limits to Sta. 90 was graded and surfaced in 1926 so this road is finished except the bridge at Turner which is to be built of concrete in November and December, 1928.

Sublimity-Willard Market Road No. 42

Grading and surfacing two and one-half miles from Sta. 206, about four miles north of Sublimity, to Sta. 338, which is two miles south of Willard, was begun in August, 1927, and finished in 1928. Graded 24 feet wide and surfaced 18 feet wide and five inches deep with 1 1/4-inch crushed gravel base and ¾-inch top. Work by county forces. Cost, $19,398.20 in 1927, and $900 in 1928.

The last section of grade and surface 1.88 miles from Sta. 338 north to Sta. 437 at Willard and a paving section, Sta. 0 at Sublimity north to Sta. 127, 2.21 miles long, were constructed in 1928. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, 1½-inch crushed rock, and pavement 16 feet wide and four inches deep bituminous concrete. Work by county forces, completed October, 1928. Total cost, $36,312.60, of which $21,137 was for paving. This road is finished except from Sta. 62 to Sta. 72.

[MARION]

Whiteaker-Drift Creek Falls Market Road No. 43

Grading and surfacing 4.90 miles from Sta. 625, one mile east of Whiteaker to Sta. 884, which is one and one-half miles south of Drift Creek Falls, was begun in 1927 and finished in 1928. Graded 24 feet wide and surfaced 18 feet wide and five inches deep with 1¼-inch crushed gravel base and ¾-inch top. Work part by county forces and part under contract to C. R. Griggs. Expended in 1927, $24,943.75; in 1928, $600.

The last section, two miles long, was graded and surfaced from Sta. 884 to Sta. 990, end of market road at Drift Creek. This was partly on new alignment. Roadbed width, 22 feet; surface 18 feet wide, five inches deep, crushed gravel. Work by county forces; begun June, 1928. Cost to November 1, $10,394.56. Estimated total cost, $15,120.

Bituminous pavement 16 feet wide, four inches deep, was laid from Sta. 593+58 at west end of road, east 1.77 miles to Sta. 687 at Road No. 42 crossing. Work by county forces; begun July, 1928; completed October 15, 1928. Cost, $16,542.74.

Pratum-Willard Market Road No. 44

Grading and surfacing 0.78 mile from Sta. 0, at Pratum, to Sta. 41, which is three-quarters mile east of Pratum. Roadbed width, 24 feet; surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base and ¾-inch top. Work begun September 1, 1926, by county forces and completed December 1, 1927. Cost, $7,072.27. Expended in 1926, $6,272.27; in 1927, $800.

In September, 1927, grading and surfacing 1.90 miles from Sta. 41, which is three-quarters mile east of Pratum, to Sta. 141, which is one mile west of Willard, was begun. Graded 24 feet wide, surfaced 18 feet wide and five inches deep with 1¼-inch crushed gravel base and ¾-inch top. Grading consisted of reshaping old grade with improvements on grades and alignment. Work by county forces was completed early in 1928 at a cost of $9,568.50. Expended in 1927, $6,598.56; in 1928, $400.

The next section 1.80 miles from Sta. 141 east to Sta. 228, completed this road. Graded 24 feet wide and surfaced 18 feet wide, five inches deep, with 1½-inch and ¾-inch crushed gravel. Work by county forces, begun June, 1928, and finished in November, 1928. Cost to November 1, $11,531.02.

Silverton-Hadley's Ranch Market Road No. 45

Graded and surfaced 3.25 miles from Sta. 0, at Silverton, to Sta. 171+50, near the Davis School. Graded 24 feet wide and surfaced 18 feet wide and five inches deep with 1¼-inch crushed gravel base and ¾-inch top. This project was quite a heavy grading job and location required a lot of study. Grade begun May 1, 1927, under contract to Earl L. McNutt and surfacing was done by county forces. Expended in 1927, $27,705.97; in 1928, $600.

The last section on this road 1.84 miles, from Sta. 171+50 near Davis School to Sta. 268+50 was graded 24 feet wide and surfaced 18 feet wide and five inches deep with crushed gravel by county forces in 1928. This included a 6 by 6 by 56-foot concrete box culvert and some heavy grading. The first mile south of Silverton, Sta. 0 to Sta. 54, was paved with bituminous concrete 16 feet wide, four inches deep, in 1928, by county forces. Cost of both jobs to November 1, $25,219.58, of which $9,174 was for pavement alone.

[MARION]

Silverton-Skaifes Ranch Market Road No. 46

In 1927 grading and surfacing two miles, extending southeast from Sta. 0, which is about one mile south of Silverton at the junction with the Silverton-Willard market road, to Sta. 105+60, was completed. Roadbed width, 24 feet; surfaced 18 feet wide, five inches deep with 1¼-inch crushed gravel base three inches deep and ¾-inch top two inches deep. All work was done by county forces. Cost, $10,907.52.

The next section 0.56 mile from Sta. 105+60 southeast to Sta. 135 was graded 24 feet wide and surfaced 18 feet wide with crushed gravel, in 1928, by county forces. Cost, $2,219.58.

Silverton-Central Howell Prairie Market Road No. 47

In 1926 and 1927 grading and surfacing 1.14 miles from Sta. 0, at Central Howell, to Sta. 60, one mile east, was completed. Grade 24 feet wide; surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel. Grading consisted of reshaping old road with improvements in grade and alignment. Work by county forces was completed December 1, 1927. Cost, $5,558.90. Expended in 1926, $3,758.90; in 1927, $1,800.

The bridge across Pudding River one mile east of Central Howell was built and approaches graded and surfaced 0.36 mile in length, extending from Sta. 60 to Sta. 79. Bridge approach fills involved about 7,200 cubic yards of excavation. The bridge, 276 feet of pile trestle, was constructed to state plans. Work begun June 1, 1927, by county forces and completed December 1, 1927. Cost, $9,201.81.

The entire road 4.07 miles was paved with bituminous concrete 16 feet wide, four inches deep, in 1928, by county forces. Cost, $42,470.61. Average cost per mile, $10,350. Most of the Salem-Silverton traffic will use this road as it is shorter and straighter than the pavement through Bethany.

Pine Tree Corner To Jack's Bridge Market Road No. 48

The entire road 0.53 mile was graded 24 feet wide and surfaced 18 feet wide, five inches deep, with 1¼-inch crushed rock base, ¾-inch top in 1928 by county forces. Cost, $2,381.12. This connects the pavement at Jack's Corner with Clackamas County roads.

Mt. Angel-North Howell Market Road No. 49

The bridge across Pudding River about two miles west of Mt. Angel at Sta. 68, consisting of an 80-foot steel span with wood trestle approaches was built to state plans. Work begun August 10, 1926, under contract to the Olds Construction Company and completed January 1, 1928, at a cost of $14,633.83. Expended in 1926, $7,752.88; in 1927, $3,908.49; in 1928, $2,972.46. Contractor dragged this job out beyond all reasonable time limits.

Grading and surfacing 1.06 miles in length, from Sta. 50, which is 1,800 feet east of the Pudding River Bridge, to Sta. 106, which is three-quarters mile west of the same. Grade 24 feet wide, surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel. Work by county forces; completed December 1, 1927. Total cost, $8,733.46.

The road was completed in 1928 by grading 24 feet wide and surfacing 18 feet wide, five inches deep, with crushed gravel from Sta. 106 west to Sta. 198 at North Howell, 1.85 miles. Job included concrete box 7 by 7 by 78 feet and a big fill. Total cost, $13,298.59.

North Howell-Lake Labish Market Road No. 50

The designated length of this road 1.04 miles, from Sta. 0 at North Howell west to Sta. 55, was graded 24 feet wide and surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel by county forces in 1928. Cost, $5,905.05. This road will probably be extended west to Road No. 37 in 1929, forming a part of the Million Dollar Highway.

Gervais-Simmons Church Market Road No. 51

Grading and surfacing 2.30 miles from Sta. 71, which is one and one-half miles southeast of Gervais, to Sta. 192. Grade 24 feet wide, surfaced 18 feet wide, five inches deep with 1¼-inch crushed gravel base, ¾-inch top. The project included four timber trestle bridges aggregating 104 lineal feet built to state standards. Work begun May 23, 1927, by county forces and completed December 1, 1927, at a total cost of $20,295.58.

Grading and surfacing of the remaining section 4.20 miles from Sta. 192 south to Sta. 414 at Simmons was done by county forces in 1928. Cost, $13,507.97. Roadbed, 24 feet wide; surface 18 feet wide, five inches deep, crushed gravel. Sta. 355 to Sta. 414 had been previously graded and base gravel placed.

Chemawa-Hazel Green Market Road No. 52

In 1926 and 1927 grading and surfacing 1.02 miles from Sta. 0, which is at Chemawa, to Sta. 54, which is 1,700 feet east of Pacific Highway, was completed. Grade 24 feet wide, surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base, ¾-inch top. Good approach curves at Pacific Highway crossing were built. Work by county forces; completed December 1, 1927. Cost, $7,467.68. Expended in 1926, $4,467.68; in 1927, $3,000.

In 1927 grading and surfacing 1.92 miles from Sta. 54, which is one-third mile east of Pacific Highway, to Sta. 155+61, which is at Hazel Green, was completed. Grading 24 feet wide, consisted of reshaping old grade with improvements in grade and alignment, and surface was 18 feet wide, five inches deep, 1¼-inch crushed gravel. Work by county forces. Cost, $8,738.64.

Livesley-Halls Ferry Market Road No. 53

Grading and surfacing 1.19 miles from Sta. 0, at Livesley, to Sta. 63, which is at Finzer. Grade 24 feet wide, surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base placed three inches deep and ¾-inch top placed two inches deep. This grading was on new alignment Work begun May 1, 1927, by county forces and completed December 1, 1927. Cost, $8,798.31.

The next section 1.25 miles grade and surface, Sta. 63 at Finzer to Sta. 127+65 near Halls Ferry completed the designated road. Roadbed, 24 feet wide; surface 18 feet wide, five inches deep, 1¼-inch crushed gravel. Work begun June, 1928, and completed October, 1928, by county forces. Cost, $7,813.45.

[MARION]

Rosedale-Fairview Market Road No. 54

Grading and surfacing of entire road 2.96 miles in length, from Sta. 0, at Rosedale, to Sta. 156+50, at Fairview, was completed. Roadbed width, 24 feet; surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base and ¾-inch top. Work involved some heavy grading on new line. Work begun June 1, 1927, surface by county forces and grade under contract to Earl L. McNutt, completed in December, 1927. Cost, $20,132.14. This road will probably be designated to Buena Vista in 1929.

Industrial Schools Market Road No. 56

The entire road 3.06 miles from Sta. 0 at feeble-minded institution to Sta. 162 at old boys' reform school was paved with bituminous concrete 16 feet wide and four inches deep by county forces in 1928. Cost, $33,-441.47 to November 1. This included grading. and gravel base course from Sta. 121 to Sta. 162.

Aurora-Wilsonville Market Road No. 59

In 1927 grading and surfacing 1.87 miles from Sta. 0, at Aurora, to Sta. 98+50, at the county line, was completed. The section was graded 24 feet wide and surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base and ¾-inch top. Grading consisted of reshaping old road. Work by county forces was completed December 1, 1927, at a total cost of $8,907.34.

East Butteville-Cemetery Corners Market Road No. 60

Entire road, 1.20 miles, grade and surface, Sta. 0 at east Butteville to Sta. 66, half a mile east of Butteville. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, crushed gravel. Work by county forces; begun July, 1928; completed December, 1928. Cost to November 1, $1,593.65. Estimated total cost, $6,190.

Donald-Yergen's Corner Market Road No. 61

Grading and surfacing one mile from Sta. 60+00, which is one mile east of Yergen's Corner, to Sta. 112+70, at Yergen's Corner, was completed. Grade 24 feet wide, surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base, ¾-inch top. Grading consisted of reshaping old grade most of the way but new line cut out two 90-degree corners. Work begun May 23, 1927, by county forces and completed December 1, 1927, at a total cost of $7.051.88, which completes this road.

Champoeg Monument Market Road No. 62

In 1926 and 1927 grading and surfacing 0.72 mile from Sta. 38, at the junction with the Newberg-Aurora road, to Sta. 0, near the Champoeg Monument, was completed. Grading consisted of reshaping and widening old grade and cutting down Champoeg hill, about 6,200 cubic yards of excavation. Included the construction of four 15-foot spans to state plans. Work by county forces; completed December 1, 1927, at a total cost of $8,316.32. Expended in 1926, $7,816.59; in 1927, $499.73.

[MARION]

Spong Market Road No. 63

In 1927 grading and surfacing of entire road two miles from Sta. 0, near the Keiser School about four miles north of Salem, to Sta. 105+64, at the junction of the Spong's Landing and Clear Lake road, was completed. Grade 24 feet wide; surfaced 18 feet wide, five inches deep, with 1¼-inch crushed gravel base, ¾-inch top. Grading consisted of reshaping old road. Work by county forces; completed December 1, 1927. Cost, $6,288.99.

West Woodburn-Broadacres Market Road No. 65

In 1927 grading and surfacing of entire road 2.73 miles from Sta. 0, at West Woodburn, to Sta. 144, at Broadacres, was completed. Grade 24 feet wide; surfaced 18 feet wide, five inches deep, 1¼-inch crushed gravel base, ¾-inch top. Work by county forces; completed December 1, 1927. Cost, $12,245.43.

West Stayton-West Market Road No. 67

Grading and surfacing of entire road 1.91 miles in length, extending from Sta. 0, near West Stayton, to Sta. 100+53.4, at junction with Turner-Marion road, was begun June 1, 1927, by county forces and completed in 1928. Cost, $7,547.51. Expended in 1927, $6,957.31; in 1928, $590.20. Grade 24 feet wide; surfaced 18 feet wide, five inches deep, crushed rock. The west mile of this improvement is on new direct alignment.

Aral Corner-Bressell Corner Market Road No. 68

Entire road 3.82 miles, grade and surface from Sta. 0 at Aral north, to Sta. 202 at Bressell. Roadbed width, 24 feet; surface 18 feet wide, five inches deep, 1¼-inch crushed gravel base, ¾-inch top. Work by county forces; begun May, 1928; completed November, 1928. Cost to November 1, $13,663.53.

MORROW COUNTY

Since the beginning in 1920 a total of $668,747.24 has been made available for market roads in Morrow County, of which $139,453.17 was from the state market road appropriation, $142,744.89 from county market road levies, and approximately $386,549.18 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. Of this total $635,784.77 has been expended and the following work accomplished: 60.88 miles graded; 57.02 miles surfaced; cooperation on Heppner-Spray Forest Highways to the extent of $82,193; maintenance during the last four years costing $2,848.83; and cooperation on state highway construction to the extent of $75,000.

During the last two years $206,237 has been spent and the following accomplished: 24.87 miles graded; 30.24 miles surfaced; cooperation on Heppner-Spray Forest Highways to the extent of $7,193, and maintenance costing $2,418.83.

Owing to a bond issue voted in 1925, considerable progress has been made in grading and surfacing the Morrow County market road system.

The Ione-Gooseberry market road has been graded and surfaced 15 miles from the city limits of Ione, leaving four miles yet to improve. Soil conditions on this section are such that travel can use the road all year.

Grading and surfacing of the Lexington-Jarmon market road has been completed, providing a surfaced road from Lexington to the Umatilla County line, 18.7 miles. The new section, 13.5 miles in length, is the best section in respect to alignment and grade that Morrow County has ever built. Owing to low valuation of the lands, a diagonal route, instead of one following property lines, was built. This road connects with the Echo-Butter Creek market road of Umatilla County and will serve as an alternative route as occasion demands, for either the Old Oregon Trail or the Oregon-Washington Highway over Franklin Hill.

Lexington-South or Clark's Canyon Market Road No. 8 has been graded and surfaced a distance of 5.90 miles from the city limits of Lexington. Originally this road and No. 15 were separate, but as surveys were developed, it was found that they should use the same route up Clark's Canyon. The full amount of $24,000 of bond funds was spent on this section. On the one-mile section southeast of Lexington, market road funds were used.

On Market Road No. 2, Upper Eight Miles, grading and surfacing has started on the 10.9-mile section from Hardman Junction at Rhea Creek to the county line. It is the intention to grade the entire unit and to surface six miles west from Rhea Creek. Forty thousand dollars of bond funds and about $3,500 of market road funds will be used. This project ends at the county line and at the end of the Ione-Gooseberry market road. The Upper Eight Mile Road as designated is to connect with a market road from Condon. As no surveys have been made it is not known just how much there is left to do in Morrow County. It appears that there will be four or five miles, depending on the Gilliam County section, to be built up from Rock Creek.

On Number 6, Heppner-Spray, a section four and three-tenths miles long, just north of Hardman, was surfaced. This project was financed by county funds. This provides a rock-surfaced road all the way from

Heppner to Hardman, except four miles. Forest highway contracts, handled by the Bureau of Public Roads, let in 1926, were completed this year. This was south of Hardman.

A very good class of work of grading and surfacing is being done on these market roads and at a fairly low cost. Probably the best project is the Lexington-Jarmon road just completed this year. No contracts in connection with these projects are let, except rock hauling. The county operates one crushing plant.

In 1928 the County Court requested that the Highway Commission approve the removal of certain market roads from the Morrow County market road system, stating that they had bond allotments available for these roads and that no market road money would ever be required. Considering that bond funds were voted for these projects and upon being assured that these projects would have proper and competent engineering and certain other agreements, the Highway Commission approved the removal of the following roads from the system. Also is shown amount of bonds available. Little Butter Creek Market Road No. 4 was removed for the same reason early in 1928.

No. 4 Little Butter Creek	$15,000
No. 7 Morgan East	15,000
No. 10 Morgan West	15,000
No. 11 Stingle Canyon-Sand Hollow	10,000
No. 12 Willow Creek	12,000
No. 13 McNabb West	18,000
No. 16 Keck Canyon	10,000
No. 17 Fuller Canyon	12,000
No. 19 Upper Rhea Creek-Sunflower Flat	20,000

Maintenance is all paid for out of the general road fund. The roads are kept in good shape at a low cost. This work is all done under the patrol system by a few men reporting to the roadmaster.

The work is all under the direction of the County Court, R. L. Benge, Judge, and L. P. Davidson and G. A. Bleakman, Commissioners. Wm. Lee McCaleb is Roadmaster. Ralph Harris, County Surveyor, is also County Engineer.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Ione-Gooseberry	21.50	14.76	.....	6.74
2. Upper Eight Mile	22.10	11.17	.....	10.93
3. Lexington-Jarmon	19.50	19.50	.....	.....
5. Lena-Vinson (Highway)	.....	.....	.....	.....
6. Heppner-Spray	20.00	4.00	0.88	15.12
8. Lexington South	12.00	6.45	.....	5.55
9. Ione-Boardman	23.00	.....	.....	23.00
14. Jordan-Rhea Creek	17.00	4.00	.....	13.00
15. Rhea Creek-Blackhorse	14.00	1.35	.....	12.65
18. Eight Mile-Hardman	8.50	.....	.....	8.50
Total	157.60	61.23	0.88	95.49

[MORROW]

Ione-Gooseberry Market Road No. 1

Ione South section, 14.62 miles of grading and surfacing, Sta. 12+00 at city limits of Ione, to Sta. 174+69.4 equals 0+28.9, to Sta. 609+50. Roadbed width, 20 feet; surface 14 and 18 feet wide, 8 inches deep. Work by county forces; begun September, 1925; completed May, 1928. Total cost, $99,297.38: Market road funds, $59,297.38; bond fund, $40,000. Expended in 1925, $8,869.21; expended in 1926, $71,886.20; expended in 1927, $18,377.86; and in 1928, $164.11. In addition to the above the county, instead of following the survey in the canyon from Sta. 609+50 and getting out on a very light grade, increased the grade to about six or seven per cent and graded and surfaced a temporary section, 0.6 mile in length, climbing onto the ridge connecting with the section line road. The road from here is sandy and can be traveled all year.

Upper Eight Mile Market Road No. 2

Rhea Creek-Gilliam County line section, three miles of grading from Sta. 9+00 to Sta. 160, and 15 miles of surfacing from Sta. 9+00 to Sta. 160 completed in 1928 to November 1. This project begins 900 feet from the Rhea Creek Bridge at junction with the Hardman road, 10.4 miles from Heppner. Roadbed width, 20 feet; surface 14 and 12 feet wide, 6 inches deep. Work by county forces; begun July, 1928. Cost to November 1, 1928, $17,851.05, bond road funds. Estimated to complete, $25,614.30. This project is 10.9 miles long and grading will probably be completed in 1928. Bond funds amounting to $40,000 have been allotted for this project so that work may proceed with no delay in financing.

Lexington-Jarmon Market Road No. 3

Unit No. 2, Base Line-County line section, 13.5 miles of grading and surfacing, Sta. 265+00, end of surfacing unit No. 1, 5.2 miles from Lexington, to Sta. 975+75 at the Umatilla County line on the Echo-Butter Creek market road. Roadbed width, 20 feet; surface 16 and 14 feet wide, 8 inches deep, crushed rock 1½ inches base rock and 1-inch top. Work by county forces; begun April, 1927; completed October, 1928. Total cost, $83,127.62: Market road funds, $8,127.62; bond road fund, $75,000. Expended in 1927, $29,620.98; expended in 1928, $53,506.64. The surfacing was completed in October, 1928. As much of the grading and all the surfacing had been done in the dry weather, ditches and shoulders were ragged, certain places needed more binder and some guard fence to erect. Probably will require about $600 to complete.

Heppner-Spray Market Road No. 6

Hardman-North section, four and three-tenths miles of surfacing and one and five-tenths miles of grading. This was graded as a county project about 1921 following approximately a county survey. Alignment was fair on two and eight-tenths miles in the canyon where work was heavy. On one and five-tenths miles north of Hardman on the flat on new work the grade should have been wider. Roadbed width, 16 and 20 feet; surface 12 feet wide, 7 inches deep, 1½-inch crusher run rock. Work by county forces; begun October, 1927; completed December, 1927. Total cost, $7,193.08, motor vehicle funds. This makes a continu-

ous rock road to Hardman, except four and eight-tenths miles from Rhea Creek to the foot of Hardman Hill called locally the McKinney Creek section. The material on this section is sandy and travel is able to go through all winter.

Chapin Creek section, 11.5 miles, Sta. 0+00 at mouth of Chapin Creek, to Sta. 607+50. Roadbed width, 14 feet; surface 12 feet wide, 8 inches deep. Work by Albert L. Smith, contractor; begun July, 1926; completed in 1928. This was a forest highway project handled by the Bureau of Public Roads. Morrow County contributed $75,000 as cooperation in 1926.

Lexington-South Market Road No. 8

Grading and surfacing five and nine-tenths miles Sta. 30+00 at city limits of Lexington, to Sta. 340. Roadbed width, 20 feet; surface 18 to 14 feet wide, 8 inches deep, 1½-inch maximum crushed rock base, 1-inch maximum top. Some coarse talus used as sub-base. Work by county forces; begun November, 1926; completed February, 1928. Total cost, $47,951.27: Market road funds, $23,951.27; bond fund, $24,000. Expended in 1926, $3,673.90; expended in 1927, $44,138.74; expended in 1928, $138.63.

Ione-Boardman Market Road No. 9

Ione-Emigrant Trail section, nine miles, Sta. 0+00 at highway at Ione, to Sta. 475 at Emigrant Trail, survey only, made in 1928. Cost $934.81. It is the plan of the County Court to start grading and surfacing this project in 1929, as soon as there is $56,000 in bonds voted for grading and surfacing this project.

Jordan-Rhea Creek Market Road No. 14

Rhea Creek survey, Sta. 0+00, which is at the end of the improved section on Rhea Creek, eight miles from Jordan Siding. This survey was made in 1927, preparatory to putting on a grading and surfacing project. Exact data as to length and probable cost not available as plans have not yet been submitted. A $30,000 allotment of bonds was voted for this project.

Rhea Creek-Black Horse Market Road No. 15

Lexington-South section, one mile of grading and surfacing, Sta. 18+75 at the city limits of Lexington (0+00 at highway) to Sta. 71+55. Roadbed width, 20 feet and fills 22 feet; surface 18 and 14 feet wide, 8 inches deep, 1½-inch maximum base and 1-inch maximum top, crushed rock. Work by county forces; begun November, 1926; completed December, 1927. Total cost, $7,965.55, market road funds.

Fuller Canyon Market Road No. 17

Grading and surfacing one and seventy-five hundredths miles, Sta. 340, (at Sta. 340 on Market Road No. 8, six and forty-five hundredths miles south of Lexington) to Sta. 432. Roadbed width, 20 feet, surface 12 feet wide, 6 inches deep, talus slide rock about 6 inches maximum. Work by county forces; begun February, 1927. Total cost, $7,439.15; Market road funds, $584.85; bond fund, $6,854.30. This project is completed except top surfacing. This was one of the roads taken off the Morrow County market road system by the State Highway Commission at the request of the county court.

MULTNOMAH COUNTY

During the time the market road act has been in operation the State Highway Commission has apportioned to Multnomah County each year 10 per cent of the state market road appropriation, which is the maximum amount which can be apportioned to any one county. A total of $944,-177.92 has been turned over to the Multnomah County treasurer, which amount was matched with an equal amount raised by a general levy on all the taxable property of the county. These funds have been expended on the roads of the county, and, as there is no classification made of the roads of the county into state roads, market roads or county roads, there is likewise no segregation of funds and the market road funds are included with funds from other sources in the construction of the county roads. During the years prior to the amendment of the act, certain of these county projects were designated as market road projects and plans and specifications placed on file with the Highway Commission. During the last four years, however, the expenditure of the market road funds in Multnomah has been left entirely to the direction of the county officials. The progress which Multnomah County is making in the improving of their county roads, which in fact are state roads and market roads in importance, is noteworthy and speaks well for the county road organization. Many problems are encountered which involve enormous traffic demands and costly right of way, and other problems peculiar to Multnomah County and which are entirely different from problems in other sections of the state. Advances are being made in all types of construction and maintenance. During the past two years many miles of road have been oiled. The types range from light oil for maintenance and dust palliative to heavy Gasco penetration type, using 1½-inch rock. An intermediate type predominates, however, with prime coat of fuel oil and surface of heavy hot Gasco and screenings.

POLK COUNTY

Since the beginning in 1920 a total of $503,139.62 has been made available for market roads in Polk County, of which $234,650.41 was from the state market road appropriation, $241,253.29 from county market road levies, and approximately $27,235.92 from cooperative funds such as motor license funds, O. and C. funds, general funds, etc. A total of $503,970.31 has been expended and the following work accomplished: 68.33 miles graded; 71.49 miles surfaced; 1.75 miles paved; major bridges costing $6,000; and maintenance during the last four years costing $10,535.03.

During the last two years $95,659.55 has been spent and the following accomplished: 13.13 miles graded; 12.30 miles surfaced; major bridges costing $6,000; and maintenance costing $8,487.48.

During the past two years crushed rock surface on the Dallas-Salt Creek-Wallace Bridge road was finished to the Tillamook Highway, providing a short all-year road to coast points from Dallas and Salem. King's Valley road also was finished with completion of Ritner Bridge and gives access to southwestern Polk and Benton counties. A big improvement on the Wallace road from West Salem to Dayton has been made near the Yamhill County line and another near the Wallace Orchard, leaving about 3.8 miles of old road, most of which is very fair gravel road now.

Polk County spent almost $100 a mile for maintenance on 42.3 miles in 1927. The work has been handled the last two years by County Judge G. L. Hawkins, Commissioners Frank Farmer and C. C. Gardner, and County Engineer E. J. Howe.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement			
		Paved with Bituminous Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Perrydale-Byerly Corner Highway	5.50	.....	4.00	.....	1.50
2. Highway-Zena-Lincoln	7.30	.....	6.30	.....	1.00
3. Ballston Road	7.00	.....	5.00	1.00	1.00
4. Dallas-Perrydale-County Line	9.10	.....	5.00	2.00	2.10
5. Wallace Road	10.30	.....	9.00	.....	1.30
6. Falls City East	4.00	.....	4.00	.....	.....
7. Lewisville-Airlie-Suver	9.00	.....	5.00	2.00	2.00
8. Dallas-Lewisville	10.80	.....	10.80	.....	.....
9. Independence South to County Line	9.00	.....	5.00	.....	4.00
10. Grande Ronde-Salmon River	8.30	.....	.....	8.30	.....
11. Dallas-Orr's Corner	3.80	.....	3.60	.....	0.20
12. Red Prairie	5.10	.....	5.10	.....	.....
14. Independence-Brunk's Corner	5.50	2.50	2.50	.....	0.50
15. Kings Valley	16.00	.....	16.00	.....	.....
16. Dallas-Salt Creek-Wallace Bridge	15.30	.....	15.30	.....	.....
Total	126.00	2.50	96.60	13.30	13.60

[POLK]

Perrydale To Highway Market Road No. 1

Perrydale section, two and forty-one hundredths miles grade and surface, Sta. 0, at Perrydale, to Sta. 127+35 at West Side Highway. Roadbed width, 24 feet; surface 16 feet wide, 6 inches deep, screen gravel 1 inch. Work by county forces; begun June, 1928; completed October, 1928. Cost, $14,329, market road funds.

Highway-Zena-Lincoln Market Road No. 2

Bethel section, one and fifteen hundredths miles grade and surface, Sta. 0, at highway, to Sta. 61, at Bethel School. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep, crushed gravel and one 19-foot timber bridge at Sta. 59. Gravel by Wm. Hill, contractor, and county forces on grade. Work begun July, 1927; completed September, 1927. Cost, $6,437.30, market road funds.

Wallace Market Road No. 5

In 1927 a bridge was built over a deep gulley at Sta. 31, which is 3,100 feet south of the Yamhill County line. The bridge consisted of five 19-foot spans on fir piles constructed to state highway standards, and 18 feet wide. The project included the grading of the approach fills, one quarter of a mile in length, extending from Sta. 24 to Sta. 38. The cuts were excavated to 18-foot width between ditches and the fills made 26 feet wide. The grading involved 5,000 cubic yards of excavation, which was done by Earl L. McNutt, sub-contractor. Work begun June, 1927, under contract to J. F. Johnson, and completed August, 1927. Total cost, $3,951.61, market road funds.

Yamhill County line to Stratton's section, nine-tenths of a mile grade and surface from Sta. 0, which is at the Yamhill-Polk County line south to Sta. 61, at Stratton's. It was begun in 1927 and finished in November, 1928. Roadbed, 24 feet wide; surface 12 feet wide, 8 inches deep, with 1½-inch screen gravel. Right-of-way clearing and grubbing for this section were donated by residents living north of the project. Sta. 24 to Sta. 38 was graded and bridge built as a separate project in 1927. Grading by county forces, gravel by contract to Walton & Rust. Cost, $3,411.58, market road funds. It is planned to construct the next section south from Stratton's to Winsor's in 1929.

Wallace Orchard-North section, one and seventy-six hundredths miles grade and surface, Sta. 142, which is two and five-tenths miles north of West Salem, to Sta. 235. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep, crushed gravel one inch. Work by county forces; begun June, 1928; completed November, 1928. Cost, $13,233.27, market road funds. This is an important road in both Polk and Yamhill Counties and may be paved or oiled.

Lewisville-Airlie-Suver Market Road No. 7

Lewisville-Airlie section, sixty-eight hundredths mile light grade and surface from Sta. 18, half a mile south of Lewisville, south to Sta. 54, just west of Airlie. Roadbed width, 20 feet; surface 14 feet wide, 6 inches deep, crushed gravel 1½ inches. Work by county forces; begun September, 1928; completed November, 1928. Cost to November 1, $1,423.44, market road funds.

[POLK]

Dallas-Lewisville Market Road No. 8

In 1927 grading and surfacing of the Falls City Road to White Bridge section, one and one-tenth miles in length, from Sta. 236, which is about five miles south of Dallas, to Sta. 273, which is just south of the White Bridge over the Luckiamute River, was completed. Graded to 20-foot standard width and surfaced 12 feet wide and 8 inches deep with 1½-inch crushed rock base and ¾-inch top. The stationing on this road runs south from Sta. 236 to Sta. 288+25, where the stationing backs up from 279+10 to 273. Work begun in June, 1927, by county forces and was completed in August, 1927, at a total cost of $5,893.52, all market road funds.

Railroad Crossing to Guthrie School section, one and thirty-three hundredths miles grade and surface, Sta. 40, one mile south of Dallas, to Sta. 72 and Sta. 116 to Sta. 154, at Guthrie School. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep, crushed gravel 1½ inches. Work by county forces; begun June, 1928; completed November, 1928. Cost to November 1, $6,851.55, market road funds.

Kings Valley Market Road No. 15

Bridge across Ritner Creek at Sta. 800, which is one-half mile north of Polk-Benton County line, consisting of one 75-foot covered span 18 feet wide on concrete piers with 97 feet of timber approaches. The project included the grading of approach fills and the surfacing of 1-inch crushed gravel 12 feet wide and 8 inches deep. Work begun in June, 1927, under contract to Hamer & Curry, and completed in October, 1927, at a total cost of $6,963.78, all market road funds.

Dallas-Salt Creek-Wallace Bridge Market Road No. 16

Wallace Bridge-Buell section, one-quarter mile of grade and surface, Sta. 193 to Sta. 206, and fifty-seven hundredths mile grade, Sta. 128 to Sta. 158, which is one-quarter mile north of Stone's Corner. County Court omitted construction on new line, Sta. 158 to Sta. 193, but improved old road around Stone's Corner with other funds. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, crushed gravel. Work by county forces; begun June, 1927; completed October, 1927. Cost, $7,156.39, market road funds.

Section from Sta. 4 at Wallace Bridge east to Sta. 128, 2.35 miles grade and surface. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, crushed gravel, 1½-inch base and 1-inch top. Included three 19-foot timber spans and two cattle passes. Grade work by Earl McNutt, contractor, and surface by H. E. Walton; begun June, 1928, and finished November 1, 1928. Cost, $21,327.54, market road funds.

SHERMAN COUNTY

Since the beginning in 1920 a total of $420,704.25 has been made available for market roads in Sherman County, of which $139,180.90 was from the state market road appropriation, $216,161.48 from county market road levies, and approximately $65,361.87 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. A total of $430,449.49 has been expended and the following work accomplished: 57.27 miles graded; 57.29 miles surfaced; maintenance during the last four years costing $6,485.62 and cooperation on state highway construction to the extent of $30,385.

During the last two years $117,320.70 has been spent and the following accomplished: 20.92 miles graded; 20.92 miles surfaced; and maintenance costing $5,219.17.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement	
		Surfaced with Rock or Gravel	Not Graded to Market Road Standards
1. Kent East	6.00	1.00	5.00
2. Grass Valley-Shearer's Grade	15.00	7.12	7.88
3. Moro-Lone Rock	8.00	6.75	1.25
4. Wasco West	3.00	3.00	.....
5. Erskine	4.50	.....	4.50
6. Fulton Canyon	6.35	6.35	.....
7. Mud Springs Canyon	6.00	2.50	3.50
8. Fulton-Anderson	5.35	5.35	.....
9. Hay Canyon	6.10	6.10	.....
10. Grass Valley-Rutledge	6.45	6.45	.....
11. Rosebush	3.00	.....	3.00
12. Kent West	3.00	1.00	2.00
13. Liberty	5.00	.....	5.00
14. Rutledge-Lone Rock-Hay Canyon	9.00	.....	9.00
15. Monkland	7.50	6.20	1.30
16. Bull Canyon	3.50	0.50	3.00
17. Cottonwood	6.00	.....	6.00
18. Wasco-Klondike East	9.00	8.00	1.00
19. Wasco-Rufus	10.00	3.28	6.72
20. Van Gilder	3.00	3.00	.....
21. Moro-Gordon Ridge	2.00	.....	2.00
22. Klondike North	1.00	1.00	.....
23. Klondike-Hay Canyon Station	3.85	3.85	.....
Total	132.60	71.45	61.15

Sherman County has made exceptional progress in the improvement of its market road system during the last biennium. Efficient management and well-planned work, cooperation between County Court, County Engineer and the people of the county are all factors contributing to this success. In many ways a small county and with limited funds, an organization has been perfected which has proven efficient and economical to such an extent that the people have responded with liberal special levies, so that the total of funds available has equaled that of counties having much larger assessed valuations and greater population. The plan has been to confine the work to one section of the county each year and to

improve all the roads in that section at that time. One year work was done east of Wasco in Klondike section and all of the market roads in the section were improved. Another year work was done west of Wasco and those market roads improved.

In 1928 the improvement center moved to Grass Valley and most of the 1929 work will be in this area. This system requires the least equipment, the least moving of equipment, the smallest organization possible and allows the most intensive planning and supervision, and explains the economy of Sherman County's work.

Standards are not held high but conform to financial ability and to the traffic possibilities; however, high class construction work is done. Construction and maintenance work on both county and market roads is organized under the County Engineer, who is also Roadmaster. With the state highway as a backbone, the mileage of surfaced market roads forms a system of laterals which will soon take care of all the people of the county. It is felt that Sherman County, organized as it is, is giving the people as much for their road money as any county in the state.

The work is all under the direction of the County Court, E. D. McKee, Judge, and L. L. Peetz and A. A. Dunlap, Commissioners. Homer S. Wall is County Engineer and Roadmaster, and acts as executive officer for the court and is actively in charge of all work.

Grass Valley-Shearer's Grade Market Road No. 2

Grading and surfacing six and ninety-seven hundredths miles, Sta. 9+87 at Grass Valley, to Sta. 378+00. Roadbed width, 24 feet; surface 12 feet wide, 10 inches deep, crushed rock, ¾-inch top, 1½-inch base. Grading by Roe B. White; surfacing by county forces; begun March, 1928; completed October, 1928. Cost, $36,395.81, market road funds. Expended in 1927, $670.73 for survey; in 1928, $35,725.08.

A survey was made in 1928 of a second section of this road from Sta. 378 to Sta. 757, which it is planned to improve in 1929.

Wasco West Market Road No. 4

Grading and surfacing 2.57 miles Sta. 284+68.0 at junction with Van Gilder and Fulton Anderson market roads to Sta. 420+63.8, one-half mile west of Wasco. Roadbed width, 22 feet; surface 12 feet wide, 10 inches deep, crushed rock, ¾-inch top, 1½-inch base. Grading by Barnett & Mitchell, contractors; surfacing by county forces. Work begun February, 1927; completed November, 1927. Cost, $16,253.46, market road funds. Expended in 1926, $199.12 for survey; in 1927, $16,054.34.

Fulton Canyon Market Road No. 6

Two concrete bridges located about half way down grade below steel bridge on market road were constructed in 1928 by county forces at a cost of $1,004.95 and $1,398.07, respectively, all general funds.

Fulton-Anderson Market Road No. 8

Grading and surfacing three and thirty-five hundredths miles, Sta. 108, two miles east of Sherman, to Sta. 284+68.0 at junction with Van Gilder and Wasco West market roads. Roadbed width, 24 feet; surface

[SHERMAN]

12 feet wide, 10 inches deep, crushed rock, ¾-inch top and 1½-inch base. Grading by Barnett & Mitchell, contractors; surfacing by county forces. Work begun February, 1927; completed November, 1927. Cost, $19,887.95, market road funds. Expended in 1926, $259.56 for survey; in 1927, $19,628.39.

Fulton-Anderson Market Road No. 8

Resurfacing of two miles, Sta. 1+00 to Sta. 108, was done by county forces in June and July, 1928, at a cost of $999.30, general funds.

Wasco-Rufus Market Road No. 19

Grading and surfacing one and forty-seven hundredths miles, Sta. 37+20, 3,700 feet north of Wasco, to Sta. 115+00. Roadbed width, 24 feet; surface 12 feet wide, 10 inches deep, crushed rock, ¾-inch top and 1½-inch base. Grading by Roe B. White, contractor; surfacing by county forces. Work begun February, 1927; completed November, 1927. Cost, $7,773.94: General funds, $2,315.27; district funds, $5,458.67.

Grading and surfacing one and one-half miles, Sta. 115, two miles north of Wasco, northerly to Sta. 172+57.2. Roadbed width, 26 feet; surface 12 feet wide, 10 inches deep, crushed rock, 1½-inch base, ¾-inch top. Grading by Roe B. White, contractor; surfacing by county forces. Work begun March, 1928; completed June, 1928. Cost, $6,605.98, district special funds. Expended in 1927, $52,14 for surveying; in 1928, $6,553.84.

Van Gilder Market Road No. 20

Grading and surfacing two and seven-tenths miles, Sta. 284+68.0 at junction with Wasco West and Fulton-Anderson market roads, to Sta. 427+50. Roadbed width, 22 and 24 feet; surface 12 feet wide, 10 inches deep, crushed rock ¾-inch top and 1½-inch base. Grading by Barnett & Mitchell, contractors; surfacing by county forces. Work begun February, 1927; completed November, 1927. Total cost, $16,374.34: Market road funds, $3,863.03; general funds, $2,511.31; bridge funds, $10,000. Expended in 1926, $209.20 for survey; in 1927, $16,165.14.

Grading and surfacing forty-four hundredths mile, Sta. 425+50 to Sta. 449. Roadbed width, 22 feet; surface 12 feet wide, 10 inches deep, crushed rock 1½-inch base, ¾-inch top. Grading by Roe B. White; surfacing by county forces. Work begun March, 1928; completed June, 1928. Cost, $2,555.77, market road funds. Expended in 1927, $52.50 for survey; in 1928, $2,503.27.

Klondike-Hay Canyon Station Market Road No. 23

Grading and surfacing two and twenty-nine hundredths miles, Sta. 345+13 one and one-half miles south of Klondike, to Sta. 466+10 at Hay Canyon station. Roadbed width 12, 16 and 22 feet; surface 12 feet wide, 10 inches deep, crushed rock, ¾-inch top, 1½-inch base. Work by Barnett & Mitchell, contractors; surfacing by county forces. Work begun February, 1927; completed November, 1927. Total cost, $13,589.42: Market road funds, $6,589.42; county special levy funds, $7,000.

TILLAMOOK COUNTY

Since the beginning in 1920 a total of $554,561.81 has been made available for market roads in Tillamook County, of which $248,230.43 was from the state market road appropriation, $228,756.69 from county market road levies, and approximately $77,574.69 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. A total of $555,485.32 has been expended and the following work accomplished: 23.97 miles graded; 25.13 miles surfaced; 1.06 miles paved; major bridges costing $79,837, and maintenance during the last four years costing $10,644.84.

During the last two years $191,110.34 has been spent and the following accomplished: 10.99 miles graded; 14.97 miles surfaced; major bridges costing $23,708, and maintenance costing $9,494.84.

During 1927 and 1928 good progress has been made toward completion of the market road system of the county. On No. 2, Netarts, the old, light draw span over Tillamook River has been replaced with a new swing draw span. All of the travel to Bay Ocean as well as to Netarts and Oceanside uses this bridge. New approaches were graded and surfaced, and at the west end, connection with the Bay Ocean Road was thrown across the slough, making flatter curves and increasing safety. The section from the draw bridge to the open country, west of the summit, has all been graded and surfaced and now, instead of narrow plank, there is a 16-foot macadam road all the way to Netarts.

On No. 3, Sand Lake-Woods-Cloverdale, from Woods, 3.12 miles east, the grade and surface are complete. From this point to Cloverdale there is a narrow but passable gravel road, some of which will be widened next year. Just north of the Cloverdale Bridge a low fill was raised and surfaced and a worn-out trestle filled.

On No. 4, Bay Ocean, bulkhead and grade has been completed to the city limits, where Bay Ocean owners take over the road. It is now possible to drive all the way from Bay Ocean to Tillamook in dry weather. Some widening needs to be done between Dix Point and the Netarts road. Surfacing will probably be started in 1929.

On No. 8, Neah-Kah-Nie Mountain, work has been done each year since 1926, so that now the road is nearly through the heavy rock work on the mountain. On account of the great quantities of rock, all waste, progress has been slow, but the material has been moved very cheaply. It is a very good example of careful shooting. In another year, considerable progress can be made with a small amount of money and it is expected that the road will be opened to Short Sand Beach.

Construction work is done both by contract and county forces and fairly good results obtained both as to cost and quality of work.

Maintenance is becoming better organized each year and the county now has sufficient equipment. The county is divided into three dstricts, each member of the court looking after one distrct, both on constructon and maintenance. Until recently, this was rather a necessary arrangement as machinery could not be moved from one part of the county to another economically. The county is badly handicapped by lack of good sources of surfacing material. Quarries are all hand quarries and expensive, and in using gravel long hauls are necessary. Surfacing costs for

[TILLAMOOK]

small projects and costs of material for use on maintenance are above the average but the results as a whole are very good.

The work has been under direction of the County Court, F. A. Beltz, Judge, and S. G. Reed and Frank Owens, Commissioners. W. S. Coates is County Engineer.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement			
		Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Wheeler-Nehalem-Scovell Bridge	6.60	.....	6.60	.....	.....
2. Netarts Road	9.10	1.20	4.20	2.10	1.60
3. Sandlake-Woods-Cloverdale	17.00	.....	9.00	0.20	7.80
4. Bay Ocean	5.40	.....	.....	5.00	0.40
5. Trask River	6.10	1.50	3.50	.....	1.10
6. Wilson River	3.70	.....	1.70	.....	2.00
7. North Fork Nehalem to Camp 4 Jct.	1.20	.....	.....	.....	1.20
8. Neah-Kah-Nie Mountain	9.30	.....	2.00	1.00	6.30
9. Miami River	12.80	.....	12.80	.....	.....
10. Doughty Road	1.70	.....	1.00	.....	0.70
11. Kilchis River	2.00	.....	1.00	.....	1.00
12. Wilson River Loop	3.40	.....	2.00	.....	1.40
13. Johnson Bridge to Peltz Corner	2.70	.....	1.00	.....	1.70
14. Long Prairie Factory to Quick's	2.60	.....	2.60	.....	.....
15. Tillamook South to Wells Corner	3.20	.....	2.90	.....	0.30
16. Pacific City Road	3.50	.....	3.50	.....	.....
17. Little Nestucca	9.70	.....	1.60	.....	8.10
18. Big Nestucca	13.70	.....	7.00	.....	6.70
19. South Bank Little Nestucca	2.20	.....	.....	.....	2.20
Total	115.90	2.70	62.40	8.30	42.50

Wheeler-Nehalem-Scovell Bridge Market Road No. 1

Anderson Creek-Coal Creek section, 0.45 miles of grading and surfacing, beginning at Sta. 1460, which is 2.46 miles north of Nehalem, to Sta. 1483. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Grading work by Austin Risjord, contractor; surfacing by county forces. Work begun June, 1927; completed September, 1928. Total cost, $6,942.78, market road funds. Expended in 1927, $5,579.73; expended in 1928, $1,363.05. This was a cut-off through a tide flat on tangent, reducing distance and bettering alignment.

Netarts Market Road No. 2

Tillamook River-Drawbridge and grading and surfacing approaches. Sta. 66, which is 1.48 miles from Third street and Fourth avenue on Roosevelt Coast Highway, in Tillamook, to Sta. 75+00. Roadbed width, 26 feet; surface 16 feet wide, 8 inches deep. Approaches graded and surfaced by county forces; bridge work by Clackamas Construction Company, contractor. Work begun May, 1928. Cost to date, $21,475.13.

This replaces an old, light draw span which has been in dangerous condition for years. The new span is a 160-foot steel swing span, pile piers and trestle approaches. Work is practically complete but final payments have not been made. Traffic has used this bridge for several weeks.

Hoag's Corner to Summit section, 1.62 miles of grading and surfacing. Clearing 151-111+50, grubbing 210-234, grading and surfacing 111+50-151 and 188-234, resurfacing 151-188. Roadbed width, 24 feet; surface 16 feet wide, 12 inches deep. Clearing by John Jenck, grading by W. F. Cain, surfacing by Stenstrom Bros. Work begun March, 1927; completed August, 1927. Total cost, $27,268.73: Market road funds, $15,615.45; general fund, $1,186.54; district fund, $10,466.74.

In 1926, the section from 151 to 188 was graded by Roy E. Smith and surfaced by county forces. Total spent in 1926, $19,328.94. Early fall rains and a soft grade made it impossible to get a gravel surface set up enough to carry traffic. In 1927 this section was reshaped and resurfaced.

Fall Creek to Oceanside section, 1.30 miles of moving sand slides and base surfacing beginning at Sta. 57, which is 8.7 miles from Tillamook and 1.08 miles from Netarts, to Sta. 126 at Oceanside. Surface 12 feet wide, 9 inches deep. Work by county forces; begun February, 1928; completed May, 1928. Total cost, $4,177.83: Market road funds, $80; general funds, $4,097.83. This section was graded and planked by the county a number of years ago. The roadbed was widened, rotten planks which would no longer carry traffic were removed. As the roadbed is all loose sand, a heavy base of clay and rock was put on. This was cheap material and a fine rock top of three or four inches will complete the surface, where without the clay much more crushed rock would have been necessary.

From Netarts, a section one and one-half miles in length was graded in 1924 and surfaced in 1925.

Sand Lake-Woods-Cloverdale Market Road No. 3

Fleck Corner-Woods section, 3.12 miles of grading and surfacing, Sta. 10 at Woods, to Sta. 177 (Cloverdale is at Sta. 250). Roadbed width, 20 feet; surface 12 feet wide, 12 inches deep. Work by county forces; begun 1926, completed August, 1928. Total cost, $34,241.46, market road funds. Expended in 1926 grade and base surface, 9-70, $15,693.12; expended in 1927 grade and base surface, 70-156, $11,734.56; expended in 1928 grade and surface, 156-177, top surface, 10-156, $6,813.78. Base surfacing of four inches maximum slide rock to a depth of eight inches was put down upon completion of grading. In 1928, a four-inch top of one and one-half-inch maximum crushed rock was put on. After two or three years of wear on this, a one-inch size top will be put on.

Sand Lake-Schoolhouse to Cheese Factory section, 0.21 mile of grading and surfacing, beginning at Sta. 308, which is 5.69 miles from Roosevelt Highway, to Sta. 319. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep. Work by county forces August, 1928. Total cost, $961.41, market road funds. Plank surface on this section was worn out, so plank was removed, roadbed widened and surfaced with crushed gravel.

Cloverdale-Fleck Corner section, 0.27 mile of grading and surfacing, Sta. 228 to Sta. 242. Roadbed width, 24 feet; surface 12 feet wide, 12 inches deep. Grading work by Lair & Company, contractors; surfacing by county forces, August, 1928. Total cost, $3,039.53: Market road funds, $2,713.53; general funds, $326. This project begins just north of the bridge at Cloverdale and is a fill of hauled-in material to replace a worn-out trestle and to raise the grade of the old road to get above high water.

[TILLAMOOK]

Bay Ocean Market Road No. 4

Flower Pot-Bay Ocean section, 1.59 miles of grading, from Sta. 207, which is 3.92 miles from junction with Netarts Road No. 4 at Tillamook Drawbridge, to Sta. 291 at Bay Ocean. From this point the Bay Ocean Company has graded the road as a city street. Roadbed width, 20 feet. Grading by Lair & Company; pile driving by W. D. Wood; bulkhead planking by Tillamook County. Work begun April, 1928; completed September, 1928. Total cost, $19,545.89, market road funds, from transfer from general fund.

In 1923 grading started at Dix Point at Sta. 128 and now is completed to Sta. 291 at Bay Ocean. From the Tillamook Drawbridge to Dix Point is a two and four-tenths-mile section, graded between 1917 and 1923, which is part planked and part graveled. This section needs widening and reshaping. Court expects to start surfacing in 1929.

North Fork of Nehalem River Drawbridge To Camp No. 4, Market Road No. 7

Right of way and fencing, Sta. 6-48+20. Clearing and grubbing Sta. 20-44. Redecking 40-foot lift span and 20-foot approach. Total cost, $1,665.22: Market road funds, $1,416.84; general funds, $248.38. The old road was crooked and dodged large stumps. New survey was made and fences lined up and large stumps either grubbed out or close cut.

Neah-Kah-Nie Mountain Market Road No. 8

Neah-Kah-Nie Mountain section, 0.80 mile of grading, Sta. 205 (0+00 at Drawbridge at Nehalem) to Sta. 245. Roadbed width, 26 feet. Work by county forces; begun May, 1926. Total cost to date, $81,469.67: Market road funds, $65,486.85; district funds, $15,982.82. Expended in 1926, 216-236, $15,063.26; expended in 1927, 205-243, $48,734.71; expended in 1928, 239-245, $16,752.14.

This year's work lacks but a few hundred feet of being through the rock work on the mountain. Coyote holes have been dug into the last rock point and it will probably be shot this year, but not excavated. In 1928 a deck truss bridge was built across a crevice. Rock has been moved very cheaply on this project.

Johnson Bridge-Peltz Corner Market Road No. 13

A bridge replacing old bridge with new 120-foot steel span and timber approaches. Bridge work by Clackamas Construction Company, contractor. Work begun May, 1928. Cost $2,232.95: Market road funds, $137.35; general fund, $2,095.60. The bridge has been completed, but under terms of contract the payments for the bridge proper are not due until in 1929.

Tillamook City South to Wells Corner Market Road No 15

Wells Corner-Blazer Bridge section, 1.02 miles grading and surfacing, Sta. 0+00 at Wells Corner on the highway two and one-half miles south of Tillamook, to Sta. 53+00 at the Blazer Bridge over Tillamook River. Roadbed width, 26 feet; surface 16 feet wide, eight inches deep. Work by county forces; begun September, 1927; completed August, 1928. Total cost, $6,103.88: Market road funds, $5,407.98; general funds, $695.90. Expended in 1927, $1,445.23; expended in 1928, $4,658.65.

[TILLAMOOK]

Grading was very light on this project, being nearly all done with a tractor and blade outfit. The 80-foot steel span over the Miami River near Garibaldi, upon completion of the highway, was moved to this road and erected at a cost of $2,644.52, which included approaches.

Pacific City Market Road No. 16

Hudson Corner to Pacific City section, 3.54 miles of ditch cleaning and resurfacing, Sta. 0+00 to Sta. 186+91.5. Surface 16 feet wide, two inches deep, ¾-inch crushed rock. Work by Roy Randall, contractor; begun June, 1928; completed August, 1928. Total cost, $4,078.55: Market road funds, $3,517.49; general funds, $561.06.

Little Nestucca Market Road No. 17

Meda to Roosevelt Highway section, 1.63 miles of grading and surfacing, Sta. 430, which is 1,900 feet east of Dunn Bridge, to Sta. 516, which is the junction with Roosevelt Highway. Roadbed width, 24 feet; surface 16 feet wide, 10 inches deep, of six-inch pit run base and four inches of 1½-inch maximum, crushed rock top. Grading work by A. T. Dolan, contractor; county forces surfacing. Work begun April, 1928; completed August, 1928. Total cost, $15,062.13: Market road funds, $14,986.61; general funds, $75.52. Expended in 1927, $10,051.09; expended in 1928, $5,011.04.

In 1927 pit run gravel six inches deep was put on as a base. In 1928, a crushing contract was awarded to Roy Randall, who furnished crushed rock in the bunkers for this and several other roads. Hauling and spreading was done by county forces. The section from Dunn Bridge at Sta. 449 to Sta. 430 was graded and surfaced also.

South Bank Little Nestucca Market Road No 19

Meda to Roosevelt Highway section, 1.80 miles of grading and surfacing, Sta. 430, which is on Market Road No. 17, 1,900 feet east of Dunn Bridge, to Sta. 525 on Roosevelt Highway, near Little Nestucca draw span. Roadbed width, 16 feet; surface 10 feet wide, three inches deep, 1½ inches crushed rock. Work by county forces August, 1928. Total cost, $1,522.50: Market road funds, $1,435.90; general funds, $86.60. Market Road No. 17 having been completed will carry most of the traffic, leaving only the local traffic for the road. The old road was ditched and shaped with a tractor and blade and surfacing material to carry light traffic put on.

UMATILLA COUNTY

Since the beginning in 1920 a total of $1,229.442.59 has been made available for market roads in Umatilla County, of which $586,979.59 was from the state market road appropriation, $572,214.43 from county market road levies, and approximately $70,248.57 from cooperative funds such as bonds, district specials, motor license funds and general funds, etc. A total of $1,246,586.05 has been expended and the following work accomplished: 139.21 miles graded; 136.98 miles surfaced; major bridges costing $59,708; maintenance during the last four years $34,528.71 and cooperation on state highway construction to the extent of $136,386.

During the last two years $234,569.75 has been spent and the following accomplished: 13.10 miles graded; 21.20 miles surfaced; major bridges costing $15,000, and maintenance costing $21,614.58.

Good progress has been made in the past two years. All of the important bridges have been rebuilt or replaced and some of the heaviest grading projects have been finished during the past four years.

Havana-Helix Market Road No. 2 has been resurfaced. On the Helix-Vansycle Market Road No. 10 construction is under way on the 4.5-mile unit south of Vansycle. Echo-Stage Gulch Market Road No. 11 has been resurfaced. Echo-Butter Creek Market Road No. 17 has been graded and surfaced for 1.5 miles out of Echo completing this road. Adams-Spring Hollow Market Road No. 29 has been resurfaced for 3.84 miles from the set-up on Thorn Hollow. Eagle Creek Market Road No. 34, 4.3 miles long, has been graded and surfaced. Adams-Thorn Hollow Market Road No. 35, 6.46 miles in length, has been graded and surfaced at a cost of about $94,000. Yoakum-Stage Gulch Market Road No. 42 has been graded, and surfaced for 2.88 miles from the highway. Yoakum South Market Road No. 44 has been graded and surfaced for 0.11 mile, including a new steel span across the Umatilla River. Surfacing has been completed on West Birch Creek Market Road No. 47 for 3.87 miles.

It is expected that four special road districts will be formed in 1928 and 1929 to levy special taxes to be matched by funds from the county general fund and to be further increased by the addition of market road funds. This is quite indicative of the satisfaction felt towards the market road program in this county as well as the desire for improved roads.

Work is done either by contract or by county forces, whichever will produce lower costs. Some very cheap contract grading has been done and some very cheap surfacing with county forces. If a contractor on a state job has a crusher set up near a market road which needs surfacing and if cheap prices can be obtained due to plant being already set up the surfacing is often done even a year or so ahead of schedule in order to take advantage of low price for surfacing. At each set-up most of the local roads within two miles or so of the plant are surfaced about 10 feet wide.

Maintenance work is well organized under the patrol system and with suitable equipment. Cost is low and the roads are kept in good condition at all times. All maintenance is paid for out of the general road fund.

[UMATILLA]

No county in the state is better organized for location, construction, maintenance, cost-keeping and keeping of record and plans and results of this are reflected in low cost and efficiency on the work. The County Court consists of I. M. Schannep, Judge, and R. E. Bean and J. O. Hales, Commissioners. L. J. Shannon is County Engineer and Roadmaster, with Walter Ransome, assistant.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Sunnyside-Umapine	7.29	7.29	.....	.....
2. Havana-Helix	9.14	9.14	.....	.....
3. Walla Walla River	6.50	4.71	.....	1.79
4. Helix Ruthers	2.50	2.50	.....	.....
5. Butter Creek	13.50	13.50	.....	.....
6. Stanfield-Despain Gulch	4.48	4.48	.....	.....
7. Weston Mountain	16.30	5.83	.....	10.47
8. Pendleton-Cold Springs (Highway)	.....	.....	.....	.....
9. Hermiston-Columbia	3.28	3.28	.....	.....
10. Helix-Vansycle	7.40	2.93	.....	4.47
11. Echo-Stage Gulch	5.47	5.47	.....	.....
12. Vansycle-Juniper	4.22	4.22	.....	.....
13. Stone Church-Hopsons	1.03	1.03	.....	.....
14. Sundquist-State Line	2.68	2.68	.....	.....
15. Mission South	7.50	4.21	.....	3.29
16. Ferndale	1.32	1.32	.....	.....
17. Echo-Butter Creek	8.34	8.34	.....	.....
18. Pine Creek	4.11	.....	4.11	.....
19. Crockett	1.23	1.23	.....	.....
20. East Side Road	2.44	2.44	.....	.....
21. Umapine-State Line	1.61	1.61	.....	.....
22. Barrett Road	1.71	1.71	.....	.....
23. East Birch Creek	3.53	3.53	.....	.....
24. Stanfield-Butter Creek	5.50	.....	.....	5.50
25. Pendleton-Despain Gulch (Highway)	.....	.....	.....	.....
26. South Cold Springs	12.50	.....	.....	12.50
27. Milton-Barrett	2.57	2.57	.....	.....
28. Adams-Crawford Hollow	3.72	3.72	.....	.....
29. Adams-Spring Hollow	3.84	3.84	.....	.....
30. Hermiston-Hinkle	3.31	3.31	.....	.....
31. Wild Horse	4.86	4.86	.....	.....
32. Athena-Helix	7.56	2.76	.....	4.80
33. Adams-Sand Hollow	4.20	2.17	.....	2.03
34. Eagle Creek	4.31	4.31	.....	.....
35. Adams-Thornhollow	6.44	6.44	.....	.....
36. Cayuse North	3.00	.....	.....	3.00
37. North Cold Springs-German Hall	6.70	.....	.....	6.70
38. Adams West	4.00	.....	.....	4.00
39. Mission-Cayuse	5.80	.....	.....	5.80
40. Despain Gulch	10.00	.....	.....	10.00
41. Reith-Stage Gulch	9.50	.....	.....	9.50
42. Yokum-Stage Gulch	5.20	2.88	.....	2.32
43. Barnhart-Stage Gulch	4.00	.....	.....	4.00
44. Yokum South	14.00	0.11	.....	13.89
45. South Reservation	5.00	.....	.....	5.00
46. Pilot Rock-McKay Creek	3.80	.....	.....	3.80
47. West Birch Creek	3.91	3.91	.....	.....
48. Weston-Dry Creek	5.00	.....	.....	5.00
49. Spofford Road	6.20	.....	.....	6.20
50. German Hall-Myrick	5.30	.....	.....	5.30
51. Winesap Road	3.39	3.39	.....	.....
52. Weston-Wildhorse	3.00	.....	.....	3.00
53. Athena-Wayland Station	7.30	.....	.....	7.30
Total	279.49	135.72	4.11	139.66

[UMATILLA]

Havana-Helix Market Road No. 2

Resurface 9.14 miles, Sta. 0, on highway at Havana, to Sta. 482+40.5, city limits of Helix. Roadbed widened to 24 feet; resurface 16 feet wide, 5 inches deep. Work by county forces; begun March, 1928; completed July, 1928. Cost, $32,383.98, market road funds.

Hermiston-Columbia Market Road No. 9

Resurface 3.28 miles, Sta. 0 to Sta. 173+18.5. Roadbed width, 22 feet; resurface 16 feet wide, 5 inches deep, 1-inch screened gravel. In addition, 1,190 cubic yards of surfacing was placed on plant road. Work by county forces; begun April, 1928; completed June, 1928. Cost, $9,182.51, market road funds.

Helix-Vansycle Market Road No. 10

North section, grading and surfacing 4.47 miles, Sta. 0, at Kuper's Ranch, to Sta. 235 at Vansycle. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep, crushed rock one-inch base and top. Work by county forces; begun October, 1928; incomplete 1928. Cost to November 1, $15,196.27, market road funds. Estimated cost, $47,060.25.

Echo-Stage Gulch Market Road No. 11

Grading and surfacing 2.13 miles, Sta. 0 at highway in Echo, to Sta. 112+75. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep, crushed rock one-inch top and base. Work by P. B. Doherty, contractor; begun February, 1928; completed August, 1928. Cost, $13,386.30, market road funds.

Echo-Butter Creek Market Road No. 17

Grading and surfacing 1.44 miles, Sta. 0, at west city limits of Echo, to Sta. 73. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep, crushed rock one-inch top and base. Work by P. B. Doherty, contractor; begun February, 1928; completed August, 1928. Cost, $14,444.16, market road funds.

Adams-Spring Hollow Market Road No. 29

Resurface 3.84 miles, Sta. 199+87.8, at junction with Adams-Thornhollow Market Road No. 35, to Sta. 0 at Adams. Resurfaced with one-inch crushed rock at the time Adams-Thornhollow Market Road No. 35 was surfaced. Work by county forces in 1927. Cost, $3,059.79, general funds.

Eagle Creek Market Road No. 34

Grading and surfacing 4.31 miles, Sta. 200+69.0 to Sta. 428+57.7. Roadbed width, 22 feet; surface 12 feet wide, 8 inches deep, crushed rock one-inch base and top. Work by county forces; begun July, 1927; completed March, 1928. Cost, $33,330.86, market road funds. Expended in 1927, $28,803.11; expended in 1928, $4,527.75.

Adams-Thornhollow Market Road No. 35

Grading 6.46 miles Sta. 4+65, at Thornhollow, to Sta. 322, junction with Adams-Spring Hollow Market Road No. 2. Roadbed width, 22 feet. Work by contract and county forces; begun February, 1926; completed

June, 1927. Cost, $75,849.41, market road funds. In 1926 graded Sta. 42 to Sta. 322, piers constructed for new crossing of Umatilla River. In 1927 grading completed and old 130-foot steel span moved to new crossing.

Surfacing 6.46 miles, Sta. 4+65, at Thorn Hollow, to Sta. 322. Surface 16 feet wide, 8 inches deep, crusher run crushed rock, one-inch base and top. Work by county forces; begun November, 1926; completed August, 1927. Cost, $19,225.49, market road funds. Crusher set up and quarry shot in 1926.

Yoakum-Stage Gulch Market Road No. 42

Grading and surfacing 2.88 miles, Sta. 0, at highway near Yoakum Sta. to Sta. 108+15.2 and a spur road Sta. 70 to Sta. 113+96.2. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep, crushed gravel, one-inch minus base and top. Grade by county forces; surfacing by Joslin & McAllister, contractors; begun May, 1928; completed November, 1928. Cost, $36,556.89, market road funds.

Yoakum South Market Road No. 44

Grading and surfacing 0.11 miles, Sta. 0, on highway, to Sta. 5+74.1, and bridge over Umatilla River, 130-foot steel span, new abutments. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep, crushed gravel one-inch base and top. Grade by county forces; surfacing by Joslin & McAllister and bridge by Kuckenberg-Wittman Company. Work begun June, 1928; completed October, 1928. Cost, $16,934.13, market road funds.

West Birch Creek Market Road No. 47

Grading and surfacing 3.87 miles, Sta. 0 at junction with highway one mile west of Pilot Rock, to Sta. 204+10, near Owens Creek. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep, crushed rock one-inch crusher run base and top. Grading by county forces in 1926; surfacing by Harness & Colby, contractors; surfacing begun January, 1927; completed April, 1927. Cost, $32,481.46, market road funds.

UNION COUNTY

Since the beginning in 1920 a total of $609,895.42 has been made available for market roads in Union County, of which $255,632.61 was from the state market road appropriation, $296,571.17 from county market road levies, and approximately $57,691.64 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds. Of this amount $574,407.99 has been expended and the following work accomplished: 79.33 miles graded; 54.68 miles surfaced; and maintenance during the last four years costing $19,807.30.

During the last two years $142,523.98 has been spent and the following accomplished: 13.98 miles graded; 16.84 miles surfaced; and maintenance costing $13,048.22.

STATUS OF MARKET ROAD SYSTEM AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Ladd Canyon-Clover Creek	13.00	2.25	2.95	7.80
2. Union-High Valley	0.70	0.18	0.24	0.28
3. Union-Cove	8.17	8.17	.....	.....
4. Hilgard-Starkey	13.00	.....	2.03	10.97
5. North Powder-County Line Bridge	4.80	4.19	.....	0.61
6. Union-Medical Springs	18.00	6.00	1.75	10.25
7. Elgin-Palmer Junction	15.00	3.20	.....	11.80
8. Telocaset-Medical Springs	14.24	1.06	3.08	10.10
9. Indian Creek	2.13	2.13	.....	.....
10. Hunter Lane-Pleasant Grove	9.85	9.85	.....	.....
11. North Powder-Clover Creek	7.03	2.02	4.08	0.93
12. Mt. Glenn	6.16	6.16	.....	.....
13. Cove-Mill Creek	1.06	1.06	.....	.....
14. Alicel-Lower Cove	12.00	10.18	.....	1.82
15. Pumpkin Ridge-Rhinehart	3.50	.....	.....	3.50
16. Pleasant Grove-Summerville	4.50	.....	.....	4.50
17. Fruitdale-County Farm	2.22	2.22	.....	.....
18. Summerville-Dry Creek	3.20	.....	.....	3.20
19. Wolf Creek	2.78	.....	.....	2.78
20. Becker Corner-Warm Creek	3.21	3.21	.....	.....
21. W. B. Hindman	4.00	.....	.....	4.00
22. Cemetery-Cricket Flat	3.37	.....	3.37	.....
23. Island City-Cove	13.90	13.90	.....	.....
24. Imbler-Summerville	3.35	3.35	.....	.....
Total	169.17	79.13	17.50	72.54

During 1927 and 1928 the major project has been the completion of the grade and surface on the Alicel-Lower Cove Market Road No. 14, and the Becker Corner-Warm Springs Market Road No. 20. These two market roads, together with the Island City. Cove Market Road No. 23, which was constructed in 1922 and 1923 as a bond road, form a loop which serves one of the richest farming districts of the Grande Ronde Valley. Excellent alignment has been obtained on the later sections of the loop. A good surface is well maintained and the area is assured of all year intercommunication with La Grande and the rest of the county.

This loop, together with other completed market roads, serves Union County with a network of roads, facilitating traffic, the transportation of products, etc. Location and construction work has been first class; costs are low and more especially on surfacing projects. The county has obtained good, up-to-date construction equipment.

[UNION]

It is very pleasing to note the improvement in construction and maintenance of the county roads connecting with or extending from the market roads. The work on county roads is mostly done with a grader outfit but is good. Surfacing of good quality is cheaply put on.

Maintenance is organized on the patrol system under the supervision of the County Engineer. The crews are well equipped, well organized and efficient. Very good work is being done and costs are reasonable. This county has, some years, a great deal of snow to remove from the roads, greatly increasing the cost of maintenance as well as requiring additional equipment.

The work is under direction of the County Court, H. W. G. Couch, Judge, and W. W. Stevens and W. R. Ledbetter, Commissioners. S. B. Morgan is County Engineer and Roadmaster.

Union-Medical Springs Market Road No. 6

Union-Miles Ranch section, 5.85 miles, grade widening and surfacing, Sta. 0+00 at city limits of Union to Sta. 198+30 = Sta. 30, to Sta. 140+70. Roadbed width, 20 feet; surface 14 feet wide, 8 inches deep, crushed rock 1½-inch minus base and 1-inch minus top. Work by county forces; begun June, 1927; completed November, 1927. Cost, $30,676.03, market road funds.

Telocaset-Medical Springs Market Road No. 8

Pondosa section, 1.06 miles surfacing, 0.42 mile of grading and 0.38 mile regrade, Sta. 728+63.5 to Sta. 784+83 at Medical Springs. Roadbed width, 18 feet; surface 14 feet wide, 6 inches deep, crushed rock 1½-inch minus base and 1-inch minus top. Work by Roscoe Neal and Grande Ronde Lumber Company, contractors. Work begun May, 1927; completed August, 1928. Cost, $5,622.16; market road funds, $1,365.04; general road funds, $4,257.12. Expended in 1927, $442.76; expended in 1928, $5,179.40.

A change through the yards of the Grand Ronde Lumber Company's lumber yard from Sta. 728+63 to 748+33 was regraded and finished.

From Pondosa to the Baker County line, a county road about one and one-half miles in length has been graded and surfaced to connect with the Baker-Medical Springs Market Road in Baker County and provides a macadam road all the way to Baker.

Hunter Lane-Pleasant Grove Market Road No. 10

Unit B, Pleasant Grove South section, 3.07 miles grading and surfacing, Sta. 476+10, 6.75 miles north of Island City (Sta. 118+54) to Sta. 633+36. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep, with 6-inch sub-base, Sta. 528-542. One and one-half inches minus crushed gravel base and 1-inch minus top. Grading work by Logan Brothers, contractors; surfacing by county forces. Work begun June, 1926; completed June, 1927. Total cost, $16,508.97, market road funds. Expended in 1926, grading, $10,459.58; expended in 1927, surfacing, $6,049.39.

North Powder-Clover Creek Market Road No. 11

Unit B, 4.08 miles, Sta. 107+79.7, 2.02 miles north of North Powder, to Sta. 323+50. Roadbed width, 22 feet. Work by county forces; begun June, 1928. Cost to date, $9,104.27, market road funds. Expended in 1928, $9,104.27. Estimated to complete, $2,787.30.

[UNION]

Alicel-Lower Cove Market Road No. 14

Surfacing 6.07 miles, Sta. 0+00 on La Grande-Joseph Highway, one and one-half miles south of Alicel, to Sta. 320+50. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep, 1-inch minus crushed rock top, 1½-inch minus base and 2½-inch minus sub-base 6 inches thick. Sta. 201-232, 242-293 and 297-300. Work by Joslin & McAllister, contractors; begun October, 1926; completed April, 1927. Cost $32,405.28, market road funds. Expended in 1926, $22,454.53; expended in 1927, $9,950.75.

Becker Corner-North Unit No. 2 section, 4.11 miles of grading and surfacing, Sta. 320-50, 6.07 miles from 0+00 on La Grande-Joseph Highway, about one and one-half miles south of Alicel, to Sta. 537+44 at Becker Corner and 0+00 of Becker Corner-Warm Creek Market Road No. 20, 4.21 miles north of Cove. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep, crushed gravel 1½-inch minus base and 1-inch minus top and 18 feet by 6-inch sub-base 395-403, 408-430 and 474-537+44. Grading work by Bechel-Middlebrooks & Hebbring, Inc., contractors; county forces surfacing. Work begun June, 1927; completed September, 1928. Total cost, $45,676.97, market road funds. Expended in 1927, grading, $14,534.16; expended in 1927, surfacing, $2,447.96; expended in 1928, surfacing $18,694.85.

Fruitdale-County Farm Market Road No. 17

Surfacing 1.60 miles, Sta. 0+00 on district road which is 3,652 feet from 0+00 at city park corner on Mt. Glenn Market Road No. 12, to Sta. 86+09.8, at intersection with Hunter Line Market Road No. 10, about one-fourth mile north of Island City. Roadbed width, 18 feet; surface 10 feet wide, 6 inches deep, base of pit run gravel up to 2½-inch. Work by county forces; begun March, 1927; completed November, 1927. Cost, $1,084.42: General funds, $484.42; donations, $600. Grading was all done with tractor and blade outfit. Gravel plant at Island City furnished gravel in bunkers at 25 cents per cubic yard.

Becker Corner-Warm Creek Market Road No. 20

Grading and surfacing 3.21 miles, Sta. 0+00 at Becker Corner at 537+44 from Alicel, to Sta. 169+54 at junction with Island City-Cove Road, one mile north of Cove. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep, 1-inch crushed gravel top, 1½-inch base and sub-base 18 feet by 6 inches, Sta. 59-168. Grading by Logan Brothers, contractors; surfacing by county forces. Work begun September, 1926. Cost, $29,187, market road funds. Expended in 1926, grading, $9,692.81; expended in 1927, grading, $277.60; expended in 1928, surfacing $19,216.59.

Cemetery-Cricket Flat Market Road No. 22

Grading 3.27 miles, Sta. 0+00 on La Grande-Joseph Highway, to Sta. 173+00. Roadbed width, 20 feet. Work by Crick & Kuney, contractors. Work begun July, 1927; completed July, 1928. Cost, $18,235.19, market road funds. Expended in 1927, $11,311.58; expended in 1928, $6,923.61.

WALLOWA COUNTY

Since the beginning in 1920 a total of $410,044.85 has been made available for market roads in Wallowa County, of which $153,865.53 was from the state market road appropriation, $157,184.01 from county market road levies, and approximately $98,995.31 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. Of this total $391,320.70 has been expended and the following work accomplished: 48.03 miles graded; 38.25 miles surfaced; maintenance during the last four years costing $4,358.39; and cooperation on state and forest highway construction to the extent of $74,877.

During the last two years $82,479.90 has been spent and the following accomplished: 17.77 miles graded; 14.77 miles surfaced; maintenance costing $2,921.13; and cooperation on state and forest highway construction to the extent of $16,781.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Enterprise-Imnaha	32.00	4.45	7.47	20.08
2. Wallowa-Troy	40.00	5.73	.....	34.27
3. Lostine-Evans-Leap	12.00	6.41	.....	5.59
4. Joseph-Armin	12.00	7.10	1.06	3.84
5. Halfway-Zumwalt	20.00	.....	.....	20.00
6. Enterprise-Lewis	18.00	.....	7.00	11.00
7. Enterprise-Chico	36.00	.....	.....	36.00
8. Enterprise-Alder Slope	5.35	5.35	.....	.....
9. Enterprise-Hurricane Creek	8.00	4.98	.....	3.02
10. Lostine Foothill Road	4.37	.....	.....	4.37
11. Wallowa-Promise	28.00	3.20	.....	24.80
12. Wallowa-Leap	10.00	.....	.....	10.00
13. Wallowa-Evans	5.50	.....	4.20	1.30
14. Wallowa-Diamond Prairie	3.16	3.16	.....	.....
15. Enterprise-Flora Highway	.....	.....	.....	.....
Total	234.38	40.38	19.73	174.27

In 1925 and 1926 about all of the market road fund in Wallowa County was used to pay off an overdraft and as cooperation on the Enterprise-Flora Highway. The county tax base was reduced about this time and the county road fund was reduced accordingly. On account of this condition a plan was arranged whereby people desirous of improving roads sign an agreement with the court to cooperate in labor and cash sufficient to do the grading providing the county will do the surfacing. The county does the blade and tractor work, furnishes culverts, etc., and charges this back to the grading. This plan is being used on all improvement work in the county and the plan is so popular that all county road and market road funds, except for maintenance, are expended in this way. Many miles of county roads, in addition to market roads, have been graded and surfaced 8 or 10 feet wide under this plan.

[WALLOWA]

All construction and maintenance work is organized under the county engineer and an efficient organization is being worked out. Such new equipment as necessary has been acquired and shops built so that equipment can be accounted for as well as repaired. Construction work is done at a very reasonable cost and surfacing, on account of a portable crusher and numerous sources of gravel, is done very cheaply. Maintenance is well organized and the roads are worked as needed and kept in good shape.

The work is under the direction of the County Court, L. E. Jordan, Judge, and Carl Whitmore and Ernst F. Johnson, Commissioners. J. D. Walker is County Engineer and Roadmaster.

Enterprise-Imnaha Market Road No. 1

Highway-East Unit No. 1, 4.45 miles of grading and surfacing, Sta. 0+00, on La Grande-Joseph Highway about three miles south of Enterprise, to Sta. 235. Roadbed width, 20 to 22 feet; surfacing 12 feet wide, 9 inches deep, crushed gravel 1½-inch base and ¾-inch top. Work by county forces; begun August, 1926; completed June, 1927. Cost, $24,942.20: Market road funds, $4,560.50; general funds, $6,295.50; county road funds, $130.40; bond fund, $12,500; donation, $1,455.80. Expended in 1926, $18,379.67; expended in 1927, $6,562.53.

Enterprise-Alder Slope Market Road No. 8

Grading and surfacing 5.36 miles Unit No. 2, Sta. 0+00 at city boundary of Enterprise, to Sta. 202+83, Unit 1, Sta. 0+00 is at Sta. 83 on Unit No. 2, and extends due west to Sta. 79+70. Roadbed width, 20 and 22 feet; surface 12 feet wide, 9 inches deep, with additional 6 inches subbase as required. Crushed gravel sub-base 2½-inch minus, base 1½-inch minus and top one-inch minus. Work by county forces; begun June, 1927; completed July, 1928. Cost, $20,989.24: Market road funds, $14,747.98; general fund, $945.52; district fund, $3,670.55; donations, $1,625.19. Expended in 1927, $7,543.80; expended in 1928, $13,445.44.

Enterprise-Hurricane Creek Market Road No. 9

Grading and surfacing 5.17 miles, Sta. 0+00 at Enterprise and extending south to Sta. 263. Roadbed width, 20 and 22 feet; surface 12 feet wide, 9 to 24 inches deep, according to conditions, crushed gravel 2½-inch minus for base and one-inch minus for top. Work by county forces; begun May, 1927; completed September, 1928. Cost, $25,440.20: Market road funds, $21,114.32; general funds, $3,112.60; district fund, $1,213.28. Expended in 1927, $16,128.54; expended in 1928, $9,311.66.

Wallowa-Diamond Market Road No. 10

Grading and surfacing 3.14 miles, Sta. 0+00 at city limits of Wallowa, to Sta. 166+65 on La Grande-Joseph Highway. Roadbed width, 22 feet; surface 12 feet wide, 9 inches deep, crushed gravel 2½-inch minus base and one-inch minus top. Work by county forces; begun March, 1927; completed September, 1927. Cost, $11,506.68: Market road funds, $5,740.05; general fund, $4,077.76; county road fund, $134.34; donations, $1,554.53.

[WALLOWA]

Wallowa-Evans Market Road No. 13

Grading 4.21 miles, Sta. 0+00, equals 34+80 on Wallowa-Troy Market Road No. 2 (0+00 at Wallowa) to Sta. 226+05 equals 179+13 on Lostine-Evans-Leap Market Road No. 3. Roadbed width, 20 feet. Work by county forces; begun March, 1927. Cost to date, $7,277.15: Market road funds, $1,143.08; general fund, $1,572.64; county road fund, $278.51; donation, $2,659.85. Expended in 1927, $7,277.15; estimated to complete, $11,048.58. Work so far has been all grading and most of that donation work or will be charged back to donation work.

Enterprise-Flora (State Highway) Market Road No. 15

County cooperation with Bureau of Public Roads, Enterprise to Flora. Work by contract; begun in 1926 and completed in 1927. Total cost, $32,914.60: Market road funds, $22,369.26; general fund, $2,397.16; revolving fund, $3,511.84; county road fund, $204.27; donation, $4,432.07. Expended in 1926, $17,165.37; expended in 1927, $15,749.23.

WASCO COUNTY

Since the beginning in 1920 a total of $540,017.64 has been made available for market roads in Wasco County, of which $224,510.53 was from the state market road appropriation, $256,114.48 from county market road levies, and approximately $59,392.63 from cooperative funds such as bonds, district specials, motor license funds, and O. and C. funds. A total of $540,349.56 has been expended and the following work accomplished: 73.22 miles graded; 71.08 miles surfaced; and maintenance during the last four years costing $7,311.71.

During the last two years $120,017.81 has been spent and the following accomplished: 21.31 miles graded; 20.17 miles surfaced; and maintenance costing $4,311.71.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Fifteen Mile Creek	5.25	5.25	.....	.....
2. Wapinitia	8.76	8.76	.....	.....
3. Mill Creek	7.06	7.06	.....	.....
4. Wrentham	10.60	7.87	2.73	.....
5. Roberts-Kuykendall Hill	18.57	18.57	.....	.....
6. Tygh Ridge	22.00	8.10	.....	13.90
7. Boyd-Dufur	4.00	4.00	.....	.....
8. Boyd-Highway	1.51	1.51	.....	.....
9. Boyd East	7.00	1.10	.....	5.90
10. Boyd Southeast	7.00	1.20	.....	5.80
11. Boyd South	8.50	1.47	.....	7.03
12. Wamic	13.00	10.56	.....	2.44
13. Friend	5.25	5.25	.....	.....
14. Shaniko-Maupin	28.10	.....	18.00	10.10
15. Wrentham-Roberts	0.80	.....	.....	0.80
16. Shaniko-Antelope-Clarno	23.30	15.86	.....	7.44
Total	170.70	96.56	20.73	53.41

Since 1923 all construction on market roads and county projects has been done by county forces under direction of the County Engineer. The organization has been developed to a degree of efficiency so that much saving is effected over the contract system. The various crews are now well supplied with equipment and the patrol system of working from headquarters under direction of the County Engineer has been established for maintenance. The results are very good, especially on maintenance.

The County Court has graded and surfaced several important county roads on the same standards as used on market roads, among which are Cherry Heights, Eight Mile, Three Mile and Pleasant Ridge Roads.

The beneficial result of an annual fund which can be counted on year after year and can only be used for construction of major roads, is well shown in this county. The state highways run east and west and north and south through the county. Most of the market roads start from the highways and, at the time, the various communities and towns off the highways are taken care of and the program in the future will be construction extensions. A good example is at Boyd. A good pit of cheap surfacing material was available. Short roads were built, one from Boyd

to Dufur and others up three different canyons leading to the ridge to the east. These short sections are built through the rocky part of the canyon to a point where the roads can be maintained as dirt roads.

A steady improvement has been shown from year to year, especially in maintenance. Definite appropriations are now made and cost records kept. The work has all been under the direction of the County Court, Judge J. T. Adkisson, until succeeded by Judge J. L. Phipps in November, 1928, and Commissioners L. B. Kelly and C. L. Curtis. P. W. Marx was County Engineer and Roadmaster until succeeded by Christ Fauerso in July, 1928.

Fifteen Mile Creek Market Road No. 1

Resurfacing 5.25 miles, Sta. 0+00 at Dufur to Sta. 277+14. Surface 12 feet wide, 3 inches deep. Work by county forces in 1927. Cost, $2,400, general road fund.

Mill Creek Market Road No. 3

Three miles oiled with light oil for penetration with a top coat of Grade "D" asphalt and stone chips. The second course was all hand work. The surface at the end of 1928 is in excellent condition. Work by county forces; begun April, 1927; completed September, 1927. Total cost, $1,677.15, general road funds.

Roberts-Kuykendall Hill Market Road No. 5

Emerson-Kuykendall Hill section, 4.78 miles of grading and surfacing, Sta. 0+00 at Emerson at end of Emerson-Roberts section, to Sta. 253. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep, crushed gravel 1½-inch base, ¾-inch top. Work by county forces; begun March, 1928; completed September, 1928. Total cost, $22,301.57: Donation funds, $200; motor license fund, $22,101.57.

The Kuykendall Hill section was graded and surfaced as a county project in 1923 and the Emerson-Roberts section in 1924. The intervening section of 4.78 miles was graded and surfaced in 1928. This 18.56-mile improvement, beginning where The Dalles-California Highway turns up Eight Mile Creek, which is about five miles from The Dalles, extends about 24 miles from The Dalles as a continuous road.

Boyd-Dufur Market Road No. 7

Surveys were made in 1927 between Boyd and Dufur, a distance of three miles and cost $800.

Dufur section, 1.72 miles of grading and surfacing, Sta. 0+00 at mouth of Easton Canyon, 1.78 miles from Boyd junction on the The Dalles-California Highway, to Sta. 90+80 at Dufur. Roadbed width, 24 feet; surface 14 feet wide, 6 inches deep, pit-run rock from Boyd pit. Work by county forces; begun 1928; completed September, 1928. Total cost, $8,061.02, market road funds. An interesting surfacing material has been developed at Boyd and used on the projects centering around Boyd. The rock is a hard basalt, but full of seams and is plowed with a rooter and trapped into trucks with fresnoes. It comes out in thin, flat pieces which break into cubes under traffic and it makes a very rigid road and requires little maintenance. It is a valuable pit to the county as they have loaded the material for as low as 25 cents per cubic yard and no machinery required.

[WASCO]

Boyd Quarry-Easton Canyon section, 0.68 mile of grading and surfacing, Sta. 0+00 at mouth of Easton Canyon, to Sta. 36+00, which is 1.78 miles from Boyd Junction on The Dalles-California Highway. Roadbed width, 24 feet; surface 14 feet wide, 6 inches deep, pit-run rock from Boyd pit. Work by county forces; begun March, 1928; completed September, 1928, at total cost of $3,601.85, all market road funds.

Boyd-Southeast Market Road No. 10

Easton Canyon section, 1.17 miles of grading and surfacing, Sta. 0+00, which is 2.47 miles from the Boyd Junction on The Dalles-California Highway and diverges at this point from Market Road No. 7, to Sta. 62 in Easton Canyon. Roadbed width, 24 feet; surface 14 feet wide, 6 inches deep, pit-run rock from the Boyd pit. Work by county forces; begun May, 1928; completed September, 1928. Total cost, $12,388.73, all market road funds.

Boyd-South Market Road No. 11

Long Hollow section, 1.28 miles of grading and surfacing, Sta. 8+50 equals 8+50 on Easton Canyon survey, which is 2.64 miles from Boyd Junction on The Dalles-California Highway, to Sta. 76+00. Roadbed width, 24 feet; surface 14 feet wide, 6 inches deep, pit-run rock from Boyd pit. Work by county forces; begun, May, 1928; completed September, 1928. Total cost, $8,174.61, market road funds.

Wamic Market Road No. 12

Grading and surfacing 8.47 miles, Sta. 0+00 at Tygh Valley, to Sta. 447+08, which is 2.63 miles southwest of Wamic. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed gravel, 1½-inch base, ¾-inch top. Work by county forces; begun in 1926; completed July, 1927. Total cost, $53,168.55, market road funds. Expended in 1926, $47,889.44; expended in 1927, $5,279.11.

Friend Market Road No. 13

Highway-Kingsley-Friend section, 3.14 miles of grading and one mile of surfacing, Sta. 0+00 on The Dalles-California Highway, to Sta. 239, near Friend. Roadbed width, 24 feet; surface 12 feet wide, 7 inches deep, crushed rock one-inch to two-inch base and one-inch top. Work by county forces; begun September, 1928; will be completed in 1929. Total cost, $12,683.34: Market road funds, $12,454.32; general funds, $229.02. Estimated to complete, $24,144.01. This project was started late in the season on account of a long-drawn-out contention over routes and then trouble in securing right of way.

Shaniko-Antelope-Clarno Market Road No. 16

Antelope East section, 8.04 miles of grading and surfacing, Sta. 85 (0+00 at Antelope) to Sta. 508. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed rock, 1½-inch base, ¾-inch top. Work by county forces; begun July, 1927; completed, 1928. Total cost, $58,177.31, market road funds. Expended in 1927, Sta. 84-448, $51,823.92; expended in 1928, Sta. 448-508, $7,353.39.

WASHINGTON COUNTY

Since the beginning in 1920 a total of $1,114,457.87 has been made available for market roads in Washington County, of which $408,253.96 was from the state market road appropriation, $436,834.55 from county market road levies, and approximately $269,369.36 from cooperative funds such as district specials, motor license funds, O. and C. funds, general funds, etc. A total of $1,151,517.87 has been expended and the following work accomplished: 138.79 miles graded; 184.40 miles surfaced; 0.44 mile paved; 24.74 miles oiled; and maintenance during the last four years costing $33,586.54.

During the last two years $394,333.60 has been spent and the following accomplished: 45.90 miles graded; 45.61 miles surfaced; 19.36 miles oiled, and maintenance costing $29,125.29.

During the past two years Washington County has made very good progress with its market road program. In 1927 early fall rains caught a number of projects unfinished and as these sections were parts of roads which had to be used during the winter, the jobs had to be finished. This greatly increased the amount of rock required as well as labor cost. During 1928 the program had to be curtailed to make up this deficit. Also during 1925, 1926 and 1927, practically the entire motor vehicle fund was credited to the market road fund and used as market road funds for bridges, construction and oiling. In 1928 this fund was applied to uses other than market road construction so a further curtailment was necessary, a part of this curtailment being the halting of the oiling program.

For many years the county has been rocking their roads after the old style which was about 12 feet wide and of varying depths, using rock up to two and one-half inches. On the market road system most of these old roads are used and the old rock scarified, reshaped and spread for a base. Usually a top course of one-inch rock 16 feet wide by four inches in depth is put on. During the last year or so this has been increased to six inches as a better base for future oiled macadam surface. By salvaging this old base and reshaping the roadbed, a considerable saving has been made. Where revisions or new locations are made such depth of base as is necessary is put down, usually four inches.

Several important projects are about completed. Among these are the Forest Grove-Timber-Columbia County line, Forest Grove-Banks, Hillsboro-North Plains, Hillsboro-Jackson School, Hillsboro-Laurel, Beaverton-Farmington, and others. The value of the market road act is well shown here for these roads have been definitely a part of the market road system for the last four years and short sections have been graded and surfaced each year until now they are being connected up and give a completed road, some of which have been oiled. It has been the plan when a local road district votes a special tax to be applied on a certain market road for the court to assign market road funds, generally in an amount equal to the amount of special tax voted. This plan makes a large number of small market road projects, scatters the funds, scatters the work, requires more equipment and more supervision, increases engineering and other costs, but seems to be a good plan. Cost of surfacing material is not increased for there are no sources of rock or gravel in the Tualatin Valley and all surfacing material for the market roads, as well as county roads, comes from permanently located crushers.

[WASHINGTON]

As the population of the county is concentrated in the Tualatin Valley, the roads radiating from the towns have a heavy traffic. There was a few years ago considerable talk of paving these and a short piece of pavement was put down at Forest Grove. In 1926 oiling of the reconstructed macadam roads was started and short sections of six different roads were oiled. In 1927 the program was continued and, at the end of the year, 24.75 miles of road had been oiled at a cost of $39,370.39. This was all of a type using fuel oil for penetration with a top of hot Gasco and small rock or gravel. Results have been very good and these roads are as good as any in the state of this type. In 1928 it was necessary to curtail this oiling program on account cooperative funds being used for other purposes. A table is shown giving the names, length and cost of roads oiled.

Construction and maintenance work is quite well organized and the county is getting a system of good roads at a very reasonable cost and they are well taken care of. Maintenance is organized on the patrol system. Construction work is all done by county forces under foremen or supervisors. Especially well organized is the maintenance for the oiled roads as patching patrol gangs are constantly watching and patching as soon as a hole starts.

The work is under the direction of the County Court, E. J. Ward, Judge, and F. W. Livermore and J. M. Hiatt, Commissioners. The construction, maintenance and cost keeping are organized under Chas. D. Jones, County Engineer and Roadmaster.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement				
		Paved with Bituminous Pavement	Oiled Rock or Gravel Surfaced	Surfaced with Rock or Gravel	Graded to Market Road Standard	Not Graded to Market Road Standard
1. Hillsboro-Scholls-Sherwood	15.40	.....	0.79	2.56	.....	12.05
2. Campbell Bridge-Laurel-Midway	3.50	.....	1.72	0.57	.....	1.21
3. Scholls Ferry and River Road	16.30	2.81	2.75	6.57	.....	4.17
4. Campbell Bridge-Beaverton	9.70	.....	.....	5.84	.....	3.86
5. Scholls-Newberg	8.20	.....	.....	2.24	.....	5.96
6. Masonic Home South to County Line	9.30	.....	.....	4.79	.....	4.51
7. Gaston East to Four Corners	0.91	.....	0.72	0.19	.....	.....
8. Forest Grove-Banks-County Line	21.00	0.90	5.46	1.00	1.07	12.57
9. Forest Grove-Gales Creek-County Line	23.50	.....	0.40	17.85	.....	5.25
10. Stringtown	4.50	0.17	.....	1.08	.....	3.25
11. Thatcher	7.30	.....	1.80	3.08	.....	2.42
12. Hillsboro-North Plains	5.70	.....	4.63	0.85	.....	0.22
13. Hillsboro-Jackson School	5.40	.....	2.24	2.41	0.29	0.46
14. Beaverton-Cedar Mill-North Plains	14.00	.....	1.86	3.32	.....	8.82
15. Mountaindale-North	2.20	.....	.....	1.00	.....	1.20
16. Mountaindale-Vadis-North Plains	3.80	.....	.....	2.84	.....	0.96
17. Scoggin Creek	4.60	.....	.....	2.46	.....	2.14
18. Mountaindale-Christie-Banks	4.50	.....	.....	1.58	.....	2.92
19. Patton Valley	5.00	.....	1.59	2.05	.....	1.36
20. Cornelius-Schefflin-Starkey Corner	5.70	.....	.....	3.97	.....	1.73
21. Cornelius South	3.00	.....	1.44	1.00	.....	0.56
22. Hillsboro-Orenco-Cornelius Pass	9.80	.....	1.30	0.99	.....	7.51
23. Beaverton-Tigard	4.30	.....	0.65	.....	.....	3.65
24. Boones Ferry	5.50	.....	2.21	1.65	.....	1.64
25. Tualatin-West Side Highway	3.00	.....	.....	1.00	.....	2.00
26. Reedville-Orenco	3.00	.....	1.14	1.04	.....	0.82
Totals	199.11	3.88	30.70	71.93	1.36	91.24

TABLE SHOWING MILEAGE AND COST OF OILED ROADS IN WASHINGTON COUNTY

Mkt. Road No.	Market Road	Station to Station	Miles	1926 Oiling Cost	1927 Oiling Cost	Total Cost	Section
1	Hillsboro-Scholls-Sherwood		0.79	$ 1,166.16	$	$ 1,166.16	Burkhalter Corner-Campbell Bridge
			0.25	160.94	.....	160.94	Jackson Bottom Experiment
			0.11	2,961.89	.....	2,961.89	Withycombe Experiment
2	Campbell Bridge-Laurel-Midway	0 — 91	1.72	.....	2,228.05	2,228.05	Campbell Bridge-Laurel
3	Scholls Ferry-River Road	0 — 64	1.21	.....	1,569.14	1,569.14	
7	Gaston East to Four Corners	10 — 48	0.72	.....	894.63	894.63	
8	Forest Grove-Banks-County Line		3.83	2,153.31	5,638.61	7,791.92	Greenville-Banks
11	Thatcher	0 — 95	1.80	.....	2,736.48	2,736.48	
12	Hillsboro-North Plains	180 — 280	1.88	2,267.01	700.33	2,967.34	Starkey Corner-Glencoe
13	Hillsboro-Jackson School	0 — 70	1.32	.....	1,620.15	1,620.15	Hillsboro-Kawna Corner
			0.92	.....	970.09	970.09	Ross Bridge-Cornell Corners
14	Beaverton-Cedar Mill-North Plains	123 — 166	0.93	1,730.16	918.86	2,649.02	Cedar Mills-Miller Corner
		27 — 77	0.93	.....	1,309.47	1,309.47	United Railways-Jackson School
19	Patton Valley	0 — 86	1.59	.....	2,053.28	2,053.28	Highway West
21	Cornelius South		1.44	.....	1,617.55	1,617.55	
22	Hillsboro-Orenco-Cornelius Pass	7+30 — 76+50	1.30	.....	1,587.43	1,587.43	Hillsboro-East
23	Beaverton-Tigard	0 — 34	0.65	.....	937.57	937.57	Beaverton-Morelock Hill
24	Boones Ferry		1.25	.....	1,539.08	1,539.08	Tualatin-South
		0 — 50	0.96	.....	1,332.26	1,332.26	Tualatin River-North
26	Reedville-Orenco	0 — 60	1.14	.....	1,278.14	1,278.14	
			24.74	$10,439.47	$28,931.12	$39,370.59	

[WASHINGTON]

Hillsboro-Scholls-Sherwood Market Road No. 1

Sherwood-Six Corners section, 0.76 miles of grading and surfacing, Sta. 0+00 at intersection of Third and Pine streets, Sherwood, to Sta. 39+80, at Six Corners on West Side Pacific Highway. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun in 1927; completed in 1928. Cost, $4,081.29: Market road funds, $3,557.69; district funds, $275. Expended in 1927, $3,557.69; expended in 1928, $523.60.

Christianson Farm section, 0.35 mile of surfacing, Sta. 15+40 (0+00 at Campbell Bridge) to Sta. 40+00. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep, about two inches of base rock placed by road district in 1926. Work by county forces; begun and completed in 1927. Cost, $889.57, market road funds.

Bonner Bridge section, 0.34 miles of grading and surfacing, Sta. 190 (between Scholls and Midway) to Sta. 208. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep. Work by county forces; begun in 1927 and completed in 1928. Total cost, $6,689.64: Market road funds, $6,239.64; district funds, $450. Expended in 1927, $3,987.92; expended in 1928, $2,701.72.

Campbell Bridge-Laurel-Midway Market Road No. 2

Campbell Bridge-Laurel section, 1.72 miles of oil-surfacing macadam, Sta. 0+00 at Laurel, to Sta. 91. Surface 16 feet wide, penetration fuel oil, top coat of Gasco and fine gravel. Work by county forces; begun and completed in 1927. Cost, $2,228.05, market road funds.

Scholls Ferry and River Road Market Road No. 3

Groner Ranch-Cole Ranch section, 0.40 miles of grading, surfacing, Sta. 74 to Sta. 95 (Sta. 176 at Groner Corner). Roadbed width, 22 feet; surface 16 feet wide, 9 inches deep. Work by county forces; begun and completed in 1927. Cost, $2,922.01: Market road funds, $2,446.15; district funds, $3,025.13.

Witch Hazel-South Unit No. 2 section, 1.15 miles of grading and surfacing Sta. 63 (0+00 on highway at Witch Hazel) to Sta. 124. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces in 1927. Cost, $6,449.87: Market road funds, $3,968.76; district fund, $2,481.11.

Portland Golf Club section, 0.23 miles of grading and surfacing, Sta. 3, at Golf Club, to Sta. 15. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun and completed in 1927. Cost, $2,123.43. This was a revision to allow more room for new club house and was paid for by the Portland Golf Club.

Groner Gap section, Sta. 0+00 at Groner's Corner, to Sta. 95+12. Work by county forces. Cost, $44.42, market road funds. Survey only so that right-of-way could be obtained and electric power poles set according to final survey. This has been charged to Market Road No. 5.

Farmington-Groner Corner section. Work completed in 1927. Cost, $124.03. Survey made along river road to determine final alignment so that electric power poles could be set. It was found that the route should be through Groner Gap. This section of No. 3 was abandoned and the Groner Gap section called No. 5.

[WASHINGTON]

Caldwell Hill section. Sta. 0+00 to Sta. 124. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Betterment project in widening the 22 feet and resurfacing a section graded in 1923 and surfaced in 1924. Work by county forces; begun in 1927. Cost, $792.13: District funds, $792.13. Expended in 1928, $792.13; estimated to complete, $2,106.92.

Progress to Robinson station section, 0.34 miles of grading and surfacing. Sta. 0+00 at Progress to Sta. 32+90 at Robinson station. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun 1927. Cost, $676.23: District funds, $676.23. Expended in 1928, $676.23; estimated to complete, $1,220.62.

Unit 3 River Road section, 0.73 miles of grading and surfacing. Sta. 124, (0+00 at west end of Caldwell Hill section) to Sta. 181. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; completed in 1928. Cost, $1,779.91: Market road funds, $538.57; district funds, $1,241.34.

Campbell Bridge-Beaverton Market Road No. 4

Campbell Bridge-Farmington section, 0.61 mile of grading and surfacing. Sta. 17+50, which is 1750 east of Campbell Bridge, to Sta. 50. Roadbed width, 22 feet; surface 16 feet wide, 7 inches deep. Work by county forces; completed 1927. Cost, $5,040.25: Market road funds, $4,157.26; district funds, $882.99.

Unit No. 2, Campbell Bridge-Farmington section, 0.50 miles of grading and surfacing, Sta. 69 to Sta. 95+60. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $2,065.25; Market road funds, $1,134.50; district funds, $930.75.

Beaverton-Hazeldale section, Sta. 0+00 at Beaverton to Sta. 214 at Hazeldale. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $13,716.77: Market road funds, $9,706.46; district funds, $4,010.31.

Unit No. 1, Farmington-Hazeldale section, 0.57 mile of grading and surfacing, Sta. 214 at Hazeldale, to Sta. 244. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $1,243.92: Market road funds, $681.97. District funds, $561.95.

Scholls-Newberg Market Road No. 5

Miller Farm-Johnson Ranch section, 0.47 mile of grading and 1.11 miles of surfacing. Sta. 72 to 96+50. Sta. 38 to 96+50 about one and one-half miles south of Scholls. Roadbed width, 24 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun and completed 1927. Cost, $2,961.89: Market road funds, $2,511.89; district funds, $450.

Johnson Ranch-Rodgers Farm section, 0.50 mile of clearing, grubbing and grading, Sta. 0+00 to Sta. 37+30 = 37+30 of Miller Farm-Johnson Ranch section. Clearing and grubbing in 1927; grader work in 1928. Work by county forces; begun 1927. Cost to date, $1,267.69, market road funds. Expended in 1927, $511.44; expended in 1928, $1,267.69.

This section was being cleared, ready for setting out walnut trees. Owner offered free right-of-way to the county if they would make their location and clear and grade enough to turn traffic through before he got ready to set out trees.

[WASHINGTON]

Baker Creek-Mountain Side Cemetery section, 0.91 mile of grading and surfacing Sta. 0+00 at one-quarter mile north of Sholls to Sta. 48 and survey Sta. 48 to 105+20. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $4,047.01: Market road funds, $2,319.34; district funds, $1,727.67.

Baker Creek-Tualatin section, Sta. 0+00 at Baker Creek, one-fourth mile north of Sholls, to Sta. 42. Survey only in 1928. Cost, $83.39; market road funds.

Masonic Home South to County Line Market Road No. 6

Swineburne Farm-Tualatin River section, 1.11 miles of grading and surfacing, Sta. 0+00 is at west end of 1925 project, to Sta. 81+10. Roadbed width, 22 feet; surface 16 feet wide, 4 and 8 inches deep. Work by county forces; begun 1926, completed 1927. Total cost, $13,325.08: Market Road funds, $11,976.28; district funds, $1,348.80. Expended in 1926, $7,390.35; expended in 1927, $5,934.73.

Unit No. 1, Four Corners-Walters Ranch section, 0.96 mile of grading and surfacing, Sta. 47+50 at four corners east of Gaston to Sta. 98+00. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $4,641.91: Market road funds, $3,197.66; district funds, $1,444.25.

Tualatin River Bridge section, 80-foot steel span and two 13-foot timber approaches, Sta. 71 to Sta. 73. Work by county forces; begun and completed 1927. Cost, $7,521.03, market road funds.

Approaches to Tualatin River Bridge section, 0.40 mile of grading and surfacing, Sta. 52+50 to 74+00. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun and completed 1928. Cost, $4,892.58, market road funds.

Walter's Ranch section, 0.38 mile of grading and surfacing, Sta. 98 (at end of 1927 project) to Sta. 118. Roadbed width, 22 feet; surface 16 feet wide, 5 inches deep. Work by county forces; begun and completed 1928. Cost, $1,432.50: Market road funds, $432.50; district funds, $1,000.

Unit No. 1, Spring Hill section, 0.46 mile of grading and surfacing, Sta. 75+00 to Sta. 99+50. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun 1928. Cost, $448.54: District funds, $448.54. Expended in 1928, $448.54; estimated to complete, $2,126.32.

Gaston-Four Corners Market Road No. 7

Gaston-Four Corners section, Sta. 10 to Sta. 48+26 at Four Corners east of Gaston. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun 1926, completed 1927. Cost, $2-994.87: Market road funds; district funds, $1,000. Expended in 1926, $2,606; expended in 1927, $388.87.

Forest Grove-Banks-Columbia County Line Market Road No. 8

Unit No. 1, Southern Pacific Railway Grade Separation section, 0.78 mile of grading and surfacing and grade separation. Clearing and grubbing Sta. 58+50 to Sta. 102+00. Grading Sta. 37 to Sta. 43 and Sta. 58 to Sta. 94. Surfacing (base) Sta. 0+00 to Sta. 56. Road bed width, 22 feet; surface 16 feet wide, 5 inches deep. Work by county forces; begun 1927; completed 1928. Cost, $27,187.23: Market road funds, $23,-032.12; district funds, $4,155.11.

[WASHINGTON]

Dairy Creek Trestle section, 0.02 mile trestle work. Sta. 17+64 to Sta. 18+76. New trestle bridge built. Cost, $1,084.52, market road funds.

Unit No. 1, Banks-Manning section, 0.23 mile of grading, Sta. 26+30 to Sta. 38+00. Roadbed width, 22 feet. Work by county forces; begun and completed 1928. Cost, $1,789.90: Market road funds, $941.26, district funds, $848.64.

Unit No 1-Cummings Hill-Buxton section, 0.15 mile of grading and surfacing, Sta. 0 to Sta. 7+80. Roadbed width 22 feet; surface 16 feet wide, 8 inches deep. Building new trestle and approaches. Work by county forces; begun and completed 1928. Cost, $1,913.30: Market road funds, $956.65.

Forest Grove-Gales Creek-County Line Market Road No. 9

Timber-Sunset Logging Company section, 3.16 miles, Sta. 1+75, 0+00 at bridge over Nehalem River at Timber, to Sta. 155+40. Roadbed width, 22 feet; surface 16 feet wide, average 6 inches deep. Work by county forces; begun and completed 1927. Cost, $25,735.99: Market road funds, $4,927.42; district funds, $20,808.57.

Sunset Camp-Columbia County line section, 2.49 miles of grading and surfacing, Sta. 155+40, at Sunset Logging Camp, to Sta. 286+00 at Columbia County line. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep. Work by county forces; begun 1928; 98 per cent complete. Cost to date, $28,223.74: Market road funds, $8,189.63; district funds, $20,034.11.

Unit No. 1, Forest Grove-United Railway section, four miles of grading and surfacing, Sta. 0+00 at end of pavement quarter mile north of forest Grove, to Sta. 211+20. Roadbed width, 22 feet; surface 18 feet wide, 6 inches deep. Work by county forces; begun 1928; 98 per cent complete. Cost to date, $24,974.07: Market road funds, $14,026.15; district funds, $10,947.92.

Stringtown Market Road No. 10

At junction of Stringtown Road with Tualatin Valley Highway about one and one-half miles west of Forest Grove. Replace old trestle with two flat bottom pipe culverts. Work by county forces; begun and completed 1927. Cost, $658.96: Market road funds, $477.78; district funds, $181.18.

Thatcher Market Road No. 11

Unit No. 4 section, 1.31 miles of grading and surfacing, Sta. 142, 0+00 at end of pavement quarter mile north of Forest Grove and at junction with Market Road No. 9, to Sta. 240. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun 1927; completed 1928. Cost, $5,623.01: Market road funds, $3,386.65; district funds, $2,236.36.

Unit No. 5 section, 0.64 mile, to Sta. 215, 0+00 at end of pavement quarter mile north of Forest Grove at junction with Market Road No. 9, to Sta. 254. Roadbed width, 22 feet; surface 16 feet wide, 5 inches deep. Work by county forces; begun and completed 1928. Cost, $3,544.37: Market road funds, $2,642.26; district funds, $902.11.

Hillsboro-North Plains Market Road No. 12

Hillsboro-S. P. Railroad section, Sta. 0+44, which is 500 feet north of Hillsboro city limits, to Sta. 34+25. Roadbed width, 22 feet; surface 16

[WASHINGTON]

feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $2,872.95: Market road funds, $1,798.86; district funds, $1,074.09.

Hillsboro-Jackson School Market Road No. 13

Connel Corner-Jackson School section, 1.16 miles of grading and surfacing, Sta. 48+17 to Sta. 109+46 at junction with Beaverton Cedar Mill-North Plains Market Road No. 14. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $3,187.88: Market road funds, $1,575.26; district funds, $1,612.62.

Hillsboro-Kamna Corner section, 0.06 mile of grading and surfacing and culvert, Sta. S at Sta. 76+60 concrete, to station box culvert. Work by county forces; begun 1927; completed 1928. Cost, $693.25, market road funds. Expended in 1927, $328.12, culvert; expended in 1928, $365.13, fills.

Ross Bridge section, 0.29 mile of grading and building new bridge on revised alignment, Sta. 151, which is 2.86 miles north of Hillsboro, to Sta. 166+50. Roadbed width, 22 feet. Work by county forces; begun and completed 1928. Cost, $2,367.90: Market road funds, $1,547.26; district funds, $820.64.

Beaverton-Cedar Mill-North Plains Market Road No. 14

Beaverton-Walker Road section, 0.78 mile of grading and surfacing, Sta. 0, at Oregon Electric Crossing in Beaverton, to Sta. 41. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $3,439.67: Market road funds, $2,571.31; district funds, $868.36.

Barnard Corner-Barnes School section, 0.69 mile of grading and surfacing, Sta. 40 (0+00 at Oregon Electric Crossing at Beaverton) to Sta. 76+50 on Walker Road. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $2,769.65: Market road funds, $1,876.30; district funds, $893.35.

Cedar-Bethany Unit No. 2 section, 1.08 miles of grading and surfacing, Sta. 168 to Sta. 225. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $4,159.86: Market road funds, $2,348.69; district funds, $1,811.17.

Kern Hill section, 0.72 mile of grading and surfacing, Sta. 225, 0+00 at Cedar Mills, to Sta. 263. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $5,725.05: Market road funds, $3,925.05; district funds, $1,800.

Twin bridges-Bethany section, 0.15 mile of grading and bridge removal, Sta. 360 to Sta. 368. Roadbed width, 22 feet. Work by county forces; begun and completed 1928. Cost, $1,035.70, county road funds.

Mountaindale-Vadis-North Plains Market Road No. 16

North Plains-Mountaindale section, Unit No. 3, 1.01 miles of grading and surfacing, Sta. 66+62 (0+00 at North Plains) to Sta. 120+00. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun and completed in 1927. Cost, $7,083.18: Market road funds, $5,726.64; district funds, $1,356.54.

[WASHINGTON]

Scoggins Valley Market Road No. 17

Unit No. 7, Sta. 0+00 at Tualatin Valley Highway about six miles southwest of Forest Grove, to Sta. 130. Roadbed width, 22 feet; surface 18 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $12,103.34. Market road funds, $8,481.34; district funds $3,622.

Mountaindale-Christi-Banks Market Road No. 18

Unit No. 1, Banks-Wilkesboro section, Sta. 30+00 to Sta. 61+00 at railroad crossing near Wilkesboro. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep. Work by county forces; begun and completed 1927. Cost, $3,062.05: Market road funds, $2,378.15; district funds, $683.90.

Christi section, 0.40 mile of grading and surfacing, Sta. 92 (Sta. 61 at railroad crossing at Wilkesboro) to Sta. 113. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $1,572.92: Market road funds, $889.13; district funds, $683.79.

Patton Valley Market Road No. 19

Unit No. 2 section, 1.13 miles, Sta. 84 (0+00 at highway junction one and one-half miles north of Gaston) to Sta. 146. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep. Work by county forces; begun and completed 1927. Cost, $14,454.11: Market road funds, $10,716.76; district funds, $3,737.35.

Unit No. 3, 0.94 mile of grading and surfacing, Sta. 146+00 (0+00 at highway junction about one and one-half miles north of Gaston) to Sta. 195+50. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1928. Cost, $5,486.61: Market road funds, $1,533.79; district funds, $3,952.82.

Cornelius South Market Road No. 21

Reeves Cut-off section, Sta. 0+00 to Sta. 54+70, survey only. County forces; begun and completed 1927. Cost, $259.20, market road funds.

Cornelius-Schefflin-Starkey Corner Market Road No. 20

Schefflin-Centerville section, 1.09 miles of resurfacing, Sta. 0+00 at Southern Pacific Railway crossing at Schefflin station, to Sta. 57+00. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun and completed 1927. Cost, $4,364.84: Market road funds, $3,463.58; district funds, $901.26.

Starkey Corner-Schefflin section, 1.06 miles of grading and surfacing, Sta. 0+00 at Starkey Corner about three miles north of Hillsboro, to Sta. 56. Roadbed width, 22 feet; surface 16 feet wide, 4 inches deep. Work by county forces; begun 1927; completed 1928. Cost, $5,727.73: Market road funds, $4,371.19; district funds, $1,356.54. Expended in 1927, $5,560.83; expended in 1928, $166.90.

Unit No. 2, Starkey Corner-Schefflin section, 0.32 mile of grading and surfacing, Sta. 46 (0+00 at Starkey Corner about three miles north of Hillsboro) to Sta. 73. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun and completed 1928. Cost, $4,004.37: Market road funds, $1,969.39; district funds, $2,034.98.

[WASHINGTON]

Cornelius-Cemetery section, 0.34 mile of grading and surfacing, Sta. 25 (0+00 at center of pavement on highway at Cornelius) to Sta. 43. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep, crushed gravel. Work by county forces, begun and completed 1927. Cost, $3,371.66; Market road funds, $2,468.32; district funds, $903.34. This section was a gap in 1926 work, left for new bridge and right of way.

Centerville Bridge section, Sta. 80 to Sta. 137+38, survey only. Cost, $112.89.

Hillsboro-Orenco-Cornelius Pass Market Road No. 22

Cornelius Pass section, Sta. 185+82.9 in Cornelius Pass in Multnomah County to Sta. 279+70, survey only. Work by county forces; begun and completed 1927. Cost, $488.16, market road funds.

Lyons Corner section, 0.45 mile of grading, Sta. 74, 0+00 at end of pavement on Eighth street, Hillsboro, to Sta. 98. Roadbed width, 22 feet. Work by county forces; begun 1927; completed 1928. Cost, $1,077.59, market road funds. Expended in 1927, $907.26, right of way; expended in 1928, $170.33, grader work.

Boones Ferry Market Road No. 24

Unit No. 5, 0.81 mile of grading and surfacing, Sta. 54 (0+00 at Clackamas County line) to Sta. 97. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep, crushed gravel. Work by county forces; begun and completed 1928. Cost, $5,912.81: Market road funds, $5,348.94; district funds, $563.87.

Tualatin section, 0.97 mile of grading and surfacing, Sta. 0+00 at corner in Tualatin to 21+68.4 at Tualatin River Bridge, and Sta. 121+80 = 0+00 to Sta. 141+83, east end of street. Roadbed width, 22 feet; surface 16 feet wide, 5 inches deep. Work by county forces; begun and completed 1927. Cost, $5,312.64; Market road funds, $3,735.59; district funds, $1,577.05. Cost includes from Sta. 113+50 to Sta. 121+80 on principal street of Tualatin, which is part of Market Road No. 25, but costs have not been segregated.

Tualatin-West Side Highway Market Road No. 25

Unit No. 1, 0.84 mile of grading and surfacing, Sta. 69+00 (0+00 on West Side Highway, to sta. 113+50 at Tualatin. Roadbed width, 22 feet; surface 16 feet wide, 6 inches deep. Work by county forces; begun 1927; completed 1928. Cost, $4,599.42. Expended in 1927, $215.71, survey; expended in 1928, $4,383.71. From Sta. 113+50 to Sta. 121+80, which is the end of No. 25, where it intersects Boones Ferry Market Road No. 24, is included in costs reported on Market Road No. 24.

Reedville-Orenco Market Road No. 26

Grading and surfacing 0.85 mile, Sta. 98 (0+00 on Tualatin Valley Highway at Reedville) to Sta. 143. Roadbed width, 22 feet; surface 16 feet wide, 8 inches deep. Work by county forces; begun 1927; completed 1928. Cost, $10,293.18; Market road funds, $8,249.90; district funds, $2,043.18. Expended in 1927, $4,446.82; expended in 1928, $5,846.26.

WHEELER COUNTY

Since the beginning in 1920 a total of $173,135.53 has been made available for market roads in Wheeler County, of which $59,979.87 was from the state market road appropriation, $70,155.66 from county market road levies, and approximately $43,000 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. Of this total $167,422.57 has been expended and the following work accomplished: 14.04 miles graded; 14.25 miles surfaced; maintenance during the last four years costing $1,847.08, and cooperation on forest highway construction to the extent of $19,623.

During the last two years $54,845.05 has been spent and the following accomplished: 2.69 miles graded; considerable betterment such as grade widening; maintenance costing $928.75; and cooperation on forest highway construction to the extent of $19,623.

During the last biennium all market road work in Wheeler County, except maintenance, was contracted, some of the jobs being advertised by the State Highway Commission upon request of the court. For several years past there has been little county construction and as it is hard to get sufficient local labor, it has proven much cheaper to build these projects by contract. In 1927 all of the county's market road fund was used in cooperation on the Heppner-Spray Forest highway. Grading from Service Creek to the John Day Bridge, and widening Donnelly Grade was a much-needed improvement and made a much safer road, as the old road was dreaded by nearly everyone who had to use it.

Maintenance is done by county outfits principally, when they are shaping up county roads in the spring. The roads are generally in fair shape and not a great deal is spent for this work. The work is under direction of the County Court, W. W. Hoover, Judge, and R. E. Wright and C. A. Cole, Commissioners. J. R. Mitchell, Resident Engineer, State Highway Department, stationed at Condon, has acted as county engineer on part-time basis.

Several years ago in a right-of-way condemnation suit a very high award was made by the jury. The county court has felt that another suit would end the same way and for this reason very high prices have been paid for right-of-way. Late in 1928, however, a case was taken to court and the decision was very favorable to the county. Since that time right-of-way has been procured for much less and more of the funds remain for construction.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement		
		Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Service Creek-Mitchell	26.00	6.30	0.60	19.10
2. Cottonwood Creek	6.00	5.00	.....	1.00
3. Pine Creek	21.00	.....	2.00	19.00
4. Winlock-Spray	10.00	.....	.....	10.00
5. Haystack Creek	6.00	.....	6.00	.....
Total	69.00	11.30	8.60	49.10

[WHEELER]

Haystack Creek (Heppner-Spray) Market Road No. 5

Highway to Forest Boundary section, 6.3 miles, Sta. 0+00 at Haystack Creek summit, approximately at the Forest Boundary, to Sta. 344 at Haystack Creek on the John Day River Highway about three miles east of Spray. Roadbed width, 20 feet. Work by Earl L. McNutt, contractor; begun in 1927; completed in 1928. County's share of cost, $19,622.98, market road funds. Expended in 1927, $13,480.25; expended in 1928, $6,142.73. This is a Forest Highway project handled by the Bureau of Public Roads and this was the county's cooperation on grading. It was expected to get the surfacing under contract in 1928, but Wheeler County was not able to furnish their share of cooperation funds so the project was deferred.

Service Creek-Mitchell Market Road No. 1

Service Creek-Donnelly Hill section, 0.57 mile, Sta. 283 at John Day River Bridge, to Sta. 312+85, near Service Creek schoolhouse, on John Day highway. Roadbed width, 20 feet. Work by Earl L. McNutt, contractor; begun January, 1928; completed April, 1928. Cost, $12,932.27, market road funds. Expended in 1927, surveys, $632.49; expended in 1928, grading, $12,299.78. As a part of this same project the contract provided for widening certain sharp turns in the Donnelly grade. This amount was increased to about $3,200. The "grade" is 7 or 8 per cent and, with a single track road on these sharp turns, was very dangerous as cars had to back up to pass. All points have been widened now so that cars can pass on the curves. In addition to this, county forces did some widening on the grade and regraded the road from the foot of the grade to the John Day River Bridge with blade and tractor outfit. The road is now reasonably safe. The section from the highway to the bridge eliminated a narrow, rough, single track road in rock over the hill and the new road is just about high water grade.

Pine Creek Market Road No. 3

Cottonwood Creek to Summit section, 2.02 miles of grading, Sta. 7+00 at junction with Cottonwood Market Road No. 2, to Sta. 114+63.3, at summit. Roadbed width, 18 feet. Work by Earl L. McNutt, contractor; begun May, 1928; completed August, 1928. Cost, $18,446.01, market road funds.

YAMHILL COUNTY

Since the beginning in 1920 a total of $592,200.77 has been made available for market roads in Yamhill County, of which $280,520.30 was from the state market road appropriation, $294,203.20 from county market road levies, and approximately $17,477.27 from cooperative funds such as bonds, district specials, motor license funds, O. and C. funds, general funds, etc. Of this total $569,925.62 has been expended and the following work accomplished 87.55 miles graded; 88.06 miles surfaced; 0.53 mile paved; and maintenance during the last four years costing $22,453.56.

During the last two years $124,203.69 has been spent and 20.68 miles graded; 23.17 miles surfaced; and maintenance costing $16,137.84 performed.

STATUS OF MARKET ROAD SYSTEM, AS OF NOVEMBER 1, 1928

Number and Name	Length in Miles	Classification as to Improvement				
		Paved with Bituminous Pavement	Paved with Concrete Pavement	Surfaced with Rock or Gravel	Graded to Market Road Standards	Not Graded to Market Road Standards
1. Yamhill-Newberg	10.50	.....	.....	10.50	.....	.....
2. Moores Valley-Carlton	7.10	.....	.....	6.80	.....	0.30
3. Gopher Valley	6.45	.....	.....	6.45	.....	.....
4. Wapato	11.60	.....	.....	9.05	.....	2.55
5. Butteville-Springbrook	7.86	.....	.....	5.40	.....	2.46
6. Amity-Hopewell	8.00	.....	.....	8.00	.....	.....
7. Gerrish Valley	6.95	.....	.....	5.60	.....	1.35
8. Rock Creek	4.40	.....	.....	4.40	.....	.....
9. Baker Creek	6.45	.....	.....	4.40	.....	2.05
10. Willamina-Coast Creek	5.81	.....	.....	5.66	.....	0.15
11. Lafayette, North	5.20	.....	.....	1.50	.....	3.70
12. Dundee West	0.79	.....	.....	0.79	.....	.....
13. Sheridan-Mill Creek	2.38	.....	.....	1.88	.....	0.50
14. Yamhill-Trullinger Mill	8.00	.....	.....	1.48	2.82	3.70
15. Amity West	7.92	.....	.....	5.00	.....	2.92
16. Dayton-Wallace Road	10.70	.....	.....	9.00	.....	1.70
17. Newberg-Woodburn	0.53	0.50	.....	.....	.....	0.03
18. Lafayette South	8.30	.....	.....	6.00	.....	2.30
19. Muddy Creek	1.67	.....	.....	1.47	.....	0.20
20. Pike	3.40	.....	.....	2.40	.....	1.00
21. McMinnville North	5.50	.....	.....	4.50	.....	1.00
22. Chehalem Mountain	4.70	.....	.....	1.36	1.61	1.73
23. Red Prairie	0.98	.....	.....	0.80	.....	0.18
24. Sheridan South	1.10	.....	.....	1.10	.....	.....
25. Bellevue-Ballston	1.85	.....	.....	1.54	.....	0.31
26. Three Mile Lane	7.00	.....	7.00	.....	.....	.....
Total	145.14	0.50	7.00	105.08	4.43	28.13

Three Mile Lane from McMinnville via Dayton to Dayton Junction, which was paved with concrete about 10 years ago, was added to the market road system as was also an extension of Number 14 from Trullinger's Mill west to Moore's Valley. Almost six miles on the road from Dayton south to West Salem were brought to standard grade and surfaced with fine gravel varying in depth according to condition of old gravel surface after completion of grading. Dundee West market road was built in 1928 and Willamina-Coast Creek market road, except one bridge, finished after

[YAMHILL]

five years' work. The work has been done by contract and county forces, the county having a good organization. Good progress has been made and another two years should almost complete the system.

The market road work has been handled by County Judge F. B. Sackett, Commissioners W. S. Allan and Frank D. Sawyer, and County Engineer H. W. Herring.

Carlton-Moores Valley Market Road No. 2

Reservoir Hill section, two miles grade and surface, Sta. 102+50 at corners west of schoolhouse east to Sta. 208, which is half a mile west of Carlton. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep. 1½-inch crushed gravel base and one-inch top. Work by Earl McNutt, contractor, and county forces; begun June, 1927; completed December, 1927. Cost, $12,969.05, market road funds.

Gopher Valley Market Road No. 3

Highway North section, 0.97 mile grade and surface, Sta. 0, on McMinnville-Sheridan Highway north to Sta. 51. Roadbed width, 24 feet; surface 14 feet wide, 6 inches deep, 1½-inch crushed gravel. Work by county forces; begun June, 1927; completed December, 1927. Cost, $3,100.63, market road funds.

Wapato-Newberg Market Road No. 4

Surfacing 1.84 miles from Sta. 0 north to Sta. 97, which is two miles southeast of Wapato. Roadbed width, 24 feet graded in 1926; surface 10 feet wide, 8 inches deep, crushed rock 1½-inch base and ¾-inch top. Work by county forces; begun June, 1927; completed November, 1927. Cost, $4,092.65, market road funds. In August, 1928, county forces straightened line at Baker Bridge and built 12-foot timber bridge. Cost, $606.52.

Gerrish Valley Market Road No. 7

Yamhill-Seaton Corner section, 1.23 miles grade and surface from Sta. 7, about one-quarter mile northwest of Yamhill, west to Sta. 72 at Seaton Corner. Roadbed width, 24 feet; surface 16 feet wide, 4 inches deep, 1-inch crushed rock on old road. Work by county forces; begun June, 1927; completed September, 1927. Cost, $2,065.94, market road funds.

Willamina-Coast Creek Market Road No. 10

Fendalls-Buck Hollow section, 1.52 miles grade and surface, Sta. 184, four miles north of Willamina, to Sta. 265, near Buck Hollow Bridge. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, 1½-inch crushed rock base and ¾-inch crushed rock top. Work by Hunt & Son, contractors; begun June, 1927; completed December, 1927. Cost, $7,041.04, market road funds.

Coast Creek section, 0.11 mile grade, surface and repair bridge, Sta. 304 north to Sta. 312+11 at Coast Creek road. The bridge was repaired by building six 15-foot approach spans, new roof and half-soling deck. Work by county forces; begun June, 1928; completed August, 1928. Cost, $1,756.53, market road funds. This completes the market road except Buck Hollow Bridge.

[YAMHILL]

Lafayette North Market Road No. 11

North section, 0.68 mile grade and surface, Sta. 0, on Market Road No. 1, south to Sta. 35+37. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, 1½-inch crushed rock base and ¾-inch top. Work by county forces; begun October, 1927; completed September, 1928. Cost, $1,508.20, market road funds.

Dundee West Market Road No. 12

Allan section, 0.78 mile grade and surface, Sta. 0, city limits, to Sta. 41, at Four Corners. Roadbed width, 24 feet; surface 12 feet wide, 6 inches deep, crushed gravel. Work by county forces; begun May, 1928; completed November, 1928. Cost, $4,564.26; Market road funds, $3,664.26; general funds, $900. Required stiff grade to reach objective without cutting walnut orchard up, but good standards of alignment and construction were secured at reasonable cost.

Yamhill-Moores Valley Market Road No. 14

Miller Ranch to Summit section, 2.80 miles, Sta. 141+65 at Miller Ranch 3.3 miles west of Yamhill, to Sta. 291 at summit of ridge. Roadbed width, 20 feet; surface 10 feet wide, 6 inches deep, 1½-inch crushed gravel. Work by county forces; begun June, 1928. Cost to November 1, 1928, $5,911.49, market road funds. Estimated total cost, $10,418.

Dayton-Wallace Road Market Road No. 16

North section, 2.12 miles light grade and resurface from Sta. 0, about half a mile south of Dayton on south to Sta. 112 at Foster fill. Roadbed width, 24 feet; surface 16 feet wide, 3 inches deep, crushed gravel ¾-inch. Work begun May, 1927; completed October, 1927. Cost, $4,875, market road funds.

Foster fill to Spaulding's section, one mile of light grade and resurface, Sta. 112 to Sta. 165 at Spaulding's north line. Roadbed width, 24 feet; surface 16 feet wide, 3 inches deep, crushed gravel ¾-inch. Work begun June, 1928, and completed in October, 1928. Cost, $2,534.29, market road funds.

Hopewell road to Unionvale section, 2.73 miles of light grade and resurface, Sta. 91, a mile east of Hopewell north to Sta. 235, which is 1,700 feet south of Unionvale store. Roadbed width, 24 feet; surface 16 feet wide, 3 inches deep, ¾-inch crushed gravel. Work begun August, 1928. Cost to date, $2,903.15. Estimated total cost, $4,013.

These three sections were built by county forces and the work consisted in the main of regrading and resurfacing the old road. Improved alignment was secured and the remaining section from Unionvale north through Spaulding's presents right-of-way problems, which, it is hoped, can be adjusted so the road can be finished in 1929. This is an important road and the county has improved it to acceptable standards at a very reasonable cost.

Newberg-Woodburn Market Road No. 17

Inter-county bridge over Willamette River was repaired by redecking span, repairing and painting truss and building new pile trestle approach at a total cost of $31,696.82, of which Yamhill County and Marion County each paid half.

[YAMHILL]

Lafayette South Market Road No. 18

Windy Booths-North section 0.7 mile grade and surface from Sta. 0, at Booth's Corner north to Sta. 34+36 on McMinnville-Dayton pavement. Roadbed width, 24 feet; surface 16 feet wide, 2 inches deep, ¾-inch crushed gravel. Work by county forces; begun April, 1927; completed August, 1927. Cost, $798.34.

Lafayette Bridge section 0.25 mile grade, surface and bridge repair from Sta. 0, at railroad, south to Sta. 13, south pier of bridge. Grade 24 feet wide; surface 12 feet wide, 8 inches deep, crushed gravel. New north approach 304 feet timber bents on concrete peds, new stringers and deck on 270-foot steel span. Contractor Earl McNutt on grade and county forces on bridge; work begun October, 1927; completed November, 1928. Cost, $7,768.36.

Muddy Valley Market Road No. 19

Highway West section, 1.61 miles grade and surface, Sta. 0, on highway two miles southwest of McMinnville, to Sta. 84, at Baptist Church. Roadbed width, 24 feet; surface 12 feet wide, 4 inches deep, crushed gravel. This job was started in 1926 and worked at again in 1927 by county forces. Cost in 1927, $2,385.69, market road funds.

Pike Market Road No. 20

Smith Hill section 0.44 mile grade and surface, Sta. 29, about five miles west of Yamhill, to Sta. 52. Roadbed width, 24 feet; surface 12 feet wide, 8 inches deep, crushed gravel. Work by county forces; begun July, 1928. Cost to November 1, $4,394.62, market road funds. Estimated cost to complete work, $200.

Chehalem Mountain Market Road No. 22

Washington County line to Oakley's section, 1.40 miles grade and surface, Sta. 0, at county line, to Sta. 72, near Oakley's. Roadbed width, 20 feet; surface 12 feet wide, 8 inches deep, crushed rock 1½-inch base, ¾-inch top. Work by county forces; begun July, 1927; completed November, 1927. Cost, $9,395.19, market road funds. A slide near top of mountain was repaired in Spring of 1928, using rock and perforated pipe to take care of drainage.

The next section, 1.60 miles, from Sta. 72 south to Sta. 157+67, which is two miles north of Newberg. Roadbed width, 20 feet, graded by county forces; begun March, 1928, and completed October, 1928. Cost, $8,384.36, market road funds. This section will be surfaced in 1929.

Sheridan South Market Road No. 24

City Limits to Schoolhouse section, 1.25 miles, grade and surface, Sta. 0, at south city limits of Sheridan, to Sta. 65+62. Roadbed width, 24 feet; surface 14 feet wide, 8 inches deep, crushed gravel. Work by county forces; begun June, 1928; completed November, 1928. Cost, $5,904.34: Market road funds, $5,304.34; general funds, $600.

Three Mile Lane Market Road No. 26

The 200-foot steel span at Dayton was redecked by county bridge crew in October, 1928. Cost, $2,826.04, market road funds.

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